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NEW COMPUTER EXPRESS

FIRST NEWS • FIRST REVIEWS • BEST BUYS • YOUR WEEKLY GUIDE

THIS WEEK

AMIGA
Commodore announces 32 CDTV titles...**Plus**...Amiga cartridge games are coming!

ATARI
Where can you buy a Mega ST2 for only £360?

PC
The best low-cost video titling package on any machine? ...**Plus**...news of a great CD-ROM bundle

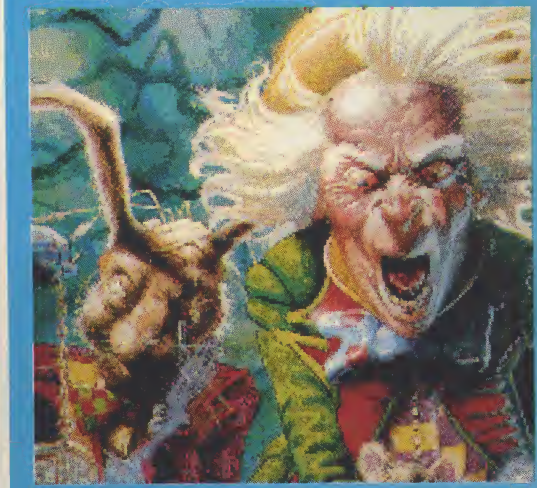
ARCHIMEDES
The Portable - it's official!

IS THIS THE ULTIMATE VIDEO GAME?

EXCLUSIVE PICTURES

Next year you could be battling through 100 square miles of virtual space

WONDERLAND



Pushing the PC to new limits

LASERS:

Are they worth the money?

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On the Gnome
SOFTWARE
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4 HARDWARE
5 AMIGA
FREE SOFTWARE!
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Append Save
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THE TOP TEN Bulletin Boards

PLUS

COLUMNS ON:
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CONSOLES
TECH TIPS
USER GROUPS
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& 52 PAGES OF
SHOPPING EXPRESS
BARGAINS !!!

THE GREAT SOFTWARE RIP-OFF The Express debate begins

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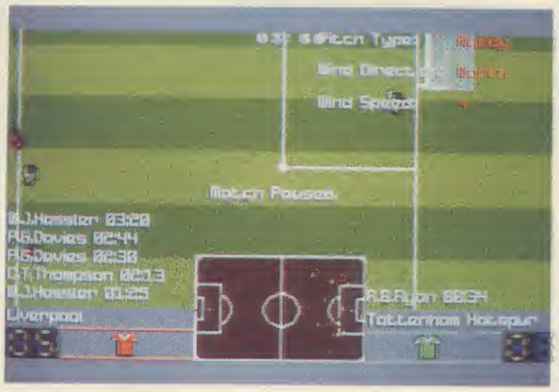
frontend

edited by Colin Campbell

Gazza II: a football game that lives up to the name



• *Spurs vs Liverpool and everything to play for - but no crying if you lose.*

It's out any time now, it's a cracking licence and believe it or not, it's one of the best footer simulations yet seen.

Gazza II from Entertainment International is being tipped for great things this Christmas because of that big-name licence as well as accurate, manageable and exciting gameplay.

It incorporates *Kick Off* style overhead graphics, but there isn't so much as a whiff of tactics. There's no ref, no fouls, no formations. In fact it's unstoppable, beautiful, total football. Football fans should revise that Christmas list. ▩

On-line post box

Royal Mail has scored another technological first by launching an electronic postage system.

The trial service, called SprintMail, will be centred at the Royal Mail's Mount Pleasant sorting office in London. Users can send text via a modem to the office, where it will be printed out and placed into open window envelopes, before being slipped into the 'first class' network.

Royal Mail says it will sort out user rates as the trial progresses. If successful it will be extended country-wide at the end of next year.

Similar systems are operating in the US, but are organised by third party companies. Royal Mail is the first national postal service to adopt the system. ▩

FAST gets a fix on Unix cheats

Influential anti-piracy organisation the Federation Against Software Theft has pledged to break an illegal scam perpetrated by re-sellers of Unix-based equipment.

FAST says unscrupulous dealers, in an attempt to bolster hardware sales, are installing Unix shells on new systems free of charge. A reasonably good Unix operating system can cost anything from £750, but dealers are tempting customers into quick buying decisions by installing a program for nothing. Apart from being absolutely illegal, this also robs customers of the appropriate support needed for a complex operating system such as Unix.

FAST's chief executive Bob Hay commented: "The Unix sector sees little of the casual copying between users that the PC world has. Instead, the problem is more sinister with perhaps 90 per cent of the copying being carried out with the sole intention of cheating the user out of the real product." Dodgy dealers are keeping the original disks thus denying users an opportunity to re-install the software at a later date.

The recent 'Unix Users Survey 1990' found deep rooted dissatisfaction among users with the quality of documentation and with post installation technical support. FAST, along with top Unix vendors, believe that the eradication of dealer piracy will raise customer satisfaction with Unix. It is estimated that up to 50 per cent of installed copies of Unix are illegal.

An advertising campaign emphasising the effects of illegally installed software is to be launched, and FAST says it will take legal action against dealers caught indulging in irregular activities. ▩

Laptop of the year

The British made Psion MC400 Mobile has been voted 'Laptop of the Year' by an international panel of computer journalists.

Writers from around the world decided on the MC400 unanimously because of its "true portability". They were impressed with its long battery life and use of solid state disks for data storage.

The Psion MC400 was launched in October 1989 and has enjoyed moderate commercial success since. Unlike the top-end MC600, it is not IBM compatible. This did not deter the judges.

Psion's machine was the only British entry to be submitted to the tenth CHIP awards. International sales director David Eider enthused: "We are particularly delighted by the recognition of our solid state disk technology as the shape of things to come."

The ten judges came from a worldwide selection of magazines including: *CHIP Italy*, Milan; *ASCII*, Tokyo; *Svet Computera*, Belgrade and *Business Computing*, London. ▩

Screaming PC

A US firm has launched a computer alarm which blasts a piercing siren to warn off thieves.

PC Screamer from Vantage Point Technologies is hidden inside a computer, and can check for unauthorised removal. It works in much the same fashion as a car alarm, but Vantage claims it won't screaming without justification.

To install it you peel the backing off the alarm unit and stick it inside the machine. Then plug the power cable in-line with a disk drive power cable. Vantage says PC Screamer is more efficient than security systems like anchored cables and locks which are often cut. ▩

Hero Quest finds computer home

HeroQuest
HeroQuest

The popular fantasy board game *Hero Quest* is to be computerised

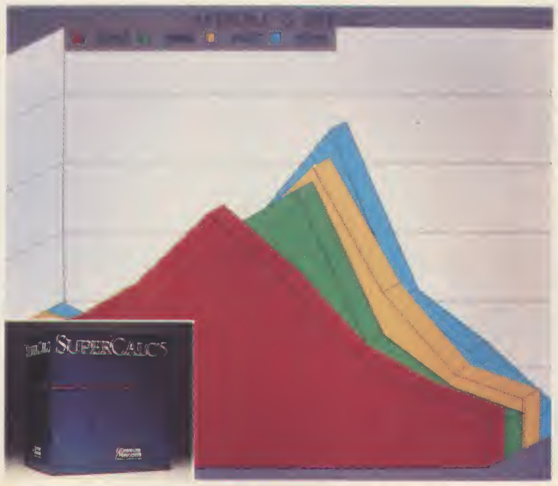
Gremlin Graphics is very pleased with itself, having scooped the licence for what has become a board game phenomenon.

Launched in 1989, *Hero Quest* became the year's biggest selling new board game and has now clocked up sales exceeding 200,000.

MB Games' creation features magic and wizards and slayers and trolls, but instead of appealing to flipped out adventure freaks, it's simple enough even for youngsters.

Gremlin's David Martin said: "*Hero Quest* was an attempt to bring fantasy role playing down to a younger age, but it's still a lot of fun for adults. It's been a great success and I think the computer version will follow that." *Hero Quest* should be here by Easter. ▩

SUPERCALC SLASHED



Supercalc: down in price but well up to scratch.

Computer Associates, one of the UK's most successful software publishers, has cut the price of its top-selling spreadsheet by an unprecedented 80 per cent.

SuperCalc has been slashed from £395 to £79. CA says it can no longer justify charging high prices for what has become a "commodity" product. The firm has called on competitors such as Lotus to follow suit. A spokesman said: "We believe our competitors are taking users for a ride."

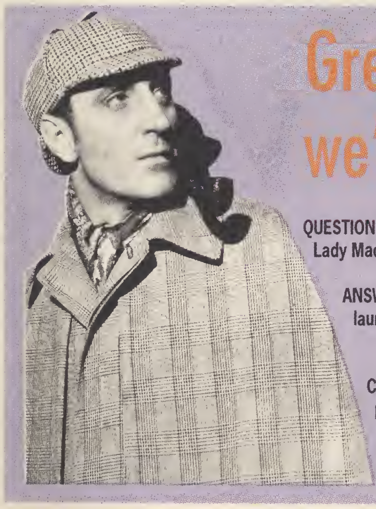
Launched nine years ago, the program has sold some three million copies worldwide; it is now up to version 5.0.

CA says the current size of the spreadsheet market is such that a lower price is justified – original pricing structures were laid down when the market was considerably smaller.

Marketing manager Mike Maunder told *Express*: "We believe that it is unfair for the end-user to pay between £200 and £400 for what is essentially a standard product. The prices of PC hardware have come down recently, now it's time for software publishers to make the same changes, it's only natural."

He said the price cut would help curtail illegal copying of business software, because buyers would be happy to pay £80 for the real thing, instead of making do with shoddy copies.

New versions of *SuperCalc* will still be forthcoming including a Windows-based program due to be launched next year.



Great Scott, Watson we're on CD

QUESTION: What have Sherlock Holmes, a bunch of birds, an atlas and Lady Macbeth got in common?

ANSWER: The Software Toolworks' new CD-ROM bundle for the PC, launched this week.

Toolworks will market the bundle, originally put together by CD specialist Optech. It features a Hitachi 1503 drive plus CD programs such as *World Atlas, The Complete Works of William Shakespeare, Multimedia Birds of America* and *The Complete Adventures of Sherlock Holmes.*

The whole kit and caboodle costs a very reasonable £459.

TURTLE TEACHING TOUR

The teenage mutant ones are to feature in a semi-educational program which aims to improve youngsters' understanding of the world.

Electric Crayon Deluxe's *Teenage Mutant Hero Turtles World Tour* is a colouring book program which allows kids to paint the turtles and their surroundings any colour they please.

It features 30 famous locations including Mount Rushmore, Stonehenge, the Eiffel Tower and the Sahara Desert.

On 16-bit versions, kids can click on special icons for pop-down information on the part of the world featured.

It's out on Amiga, ST, PC, C64 and CPC, prices start at £9.99, call 0207 71417.

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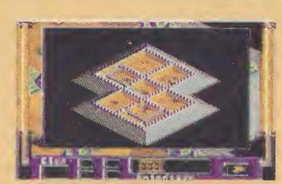

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EXPRESS MAIL SPECIAL

H F-W delves in his mailbag to present a round-up of your opinions on piracy in all its forms.

PART ONE
More Next Week...

■ Cheap but not nasty

Everyone writes in, either justifying or condemning piracy, yet very few offer solutions to the main problem which is cost. Who, if honest, would pay £25-£40 for a game if they could get it cheaper? Answer: no one. This is why piracy will always be with us.

However most people will buy a good product at a fair price. So here is my solution – buy mail order! Why? Because most software can be bought for £10 or less – a much less expensive method of building up a library of games. By joining 'Special Reserve' for £6 per year you can buy cheap software without being a pirate. I do all my shopping this way and can thoroughly recommend it to everyone.

It is easy to be a thief but hard to be honest, however the honest man can get support, the thief can get jail. Which do you prefer? I am very pleased with the quality of Amiga software being produced (legitimately) and feel the programmers deserve the same consideration as anybody who helps bring pleasure to millions.

James Abram. Wolverhampton

It's not hard to be honest. You just have to go without things you can't afford, which is sometimes less fun. If you can't afford a game, then you can always wait for it to be re-released at a budget price, or take the approach that you do, and make the money you have available to buy games go further.

H F-W

■ Seeing both sides

I understand both sides of the piracy argument since I have worked for 14 years as a computer analyst/programmer (including writing a pop chart system for the record industry) and I have recently purchased an Atari ST.

First the *Express* position. Nice try lads, but you're not fooling anyone. You depend on the manufacturers, software houses and distributors for your revenue. The 70p cover price does not go far.

Piracy does cost companies money but, since the vast majority of software pirated would never have been purchased at the full price, the actual cost of piracy is not exactly life-threatening to an industry in which mere incompetence, greed, mendacity and laziness are no bar to making a fortune out of gullible teenagers and their doting parents.

Beware all of you. The same was once true of local radio and, before that, television. These industries have been forced to grow up, you will be too. Take a tip and stop overselling all your products. Come clean, play fair – and then start casting stones at pirates.

Now for you pirates. I understand the gripes about expensive software and your annoyance at all those hidden extras. Piracy, however, is no better than stealing even if you wouldn't have bought the product otherwise. You cannot expect the industry to play fair if you keep on cheating. All this stuff cuts two ways.

Furthermore, you don't know you're born! Even bad games and derivative copies cost a lot of money to produce – and we technicians don't come cheap. Originality is beyond price. These guys deserve £21.95 for *Dungeon Master*, even if they only deserve £2.99 for *Ninja Turbo Outrun III – The Movie*. If you were a more discerning buyer you wouldn't be so easy to rip off.

So don't pirate. Don't trust the suppliers – or the computer press! – without thinking first. Don't buy any old rubbish because it has a turtle, and Australian soap star or a famous retired (or not) racing driver on it.

Paul Beard, Kendal, Cumbria

Hmm. The *Express* line. Here on the *Express* team, we are involved in producing a product which we sell, and the idea of people ripping us off is not very appealing. We would no more like to see people stealing copies of *Express* from the newsagents or photocopying pages and giving them away to their friends, than we like to see people pirating games. And as to being supported by the industry – we doubt very much that we would see a 10 per cent increase in advertising spend if a reduction in piracy led to a 10 per cent increase in revenue or even profit for the software publishers. Our line on piracy is a very simple, moral one. We don't condone theft.

But apart from your slight cynicism about the *Express* line, I agree with every point you make Paul.

H F-W

■ 2 pee's worth

Just to add my two-pennies' worth to the piracy debate, I would like to draw everyone's attention to the licensing agreement found in many of the large, professional packages, such as Lotus's excellent *Symphony*. This licence allows the customer to use the package on ONE machine only. 'So what', you say.

Alright then, what do you review PC emulators with? Is not testing, and/or running, commercial programs on a different machine equivalent to breaking the terms in the licensing agreement? I can't see anyone forking out £200 on a PC emulator for their ST (or whatever) and then having to lash out four or five hundred on software.

Steven Stewart, Belfast.

We review emulators with copies of PC programs that we have been given to use for review purposes. And your argument about forking out for PC software after you buy an emulator is crap. According to your logic, you can't see anyone lashing out four or five hundred on software after they have forked out for a PC? Get outa here!

H F-W

■ Cheats!

Software piracy. No, let's call a spade a spade: theft I couldn't agree more, theft is wrong. So why do games programmers put in things like word processors which can be called up in order to deceive employers into thinking their employees are working when in fact they are playing games, on the employer's computers, in the employer's time, using the employer's electricity? (If you need an example, check the questions and answers section in the user's manual of Rainbird's *UMS*). It seems the programmers not only condone theft, but actively encourage it. I think the programmers should put their own house in order before they start complaining.

R Peters, Ipswich, Suffolk

Good point, and an easy one to miss!

H F-W

■ Bitter and twisted?

Having worked for the entertainment industry for a couple of years, and having been treated as trash at times, I am absolutely revolted by the hypocritical stench that those ELSPA anti-pirate ads exude.

To hear accusations of theft and 'piracy' coming from an industry that is itself teeming with sharks and ruthless con men, which employs so many questionable money-generating techniques itself, I find fascinating.

For example: do I call FAST to denounce the software companies who bought one copy of *DevPac* or *DPaint* to duplicate it internally and give to their programming teams? (Yes you do, on 0628 660377 – H F-W) Maybe I could use the £1,000 reward money to pay the solicitor's fees to hunt down my royalties that those same companies still owe me for months and months of hard intellectual labour?

The only reason why I think ELSPA and co are pushing their ads out is to raise their member companies' profit margins; after all, hasn't the price of 16-bit software been fairly constant for the past n years? If piracy was really undermining the industry, wouldn't prices have to go up to compensate for the erosion?

To sum up: I think that many members of ELSPA should first clean up their own acts thoroughly before they start pointing fingers at others who are committing acts of negligible illegality compared to theirs!

V Lawrence, Manchester

■ Double standards

I recently received through the post an unsolicited, pre-production full working copy of *DPaint* ST which was sent by someone who works for a games company. My copy was copied from an illegal copy which is being passed around within the company. This, after already receiving a hacked copy of Degas *Elite* from the Software Development Manager of another games company.

It prompts me to ask:' When is a pirate not a pirate?'

Name and Address Withheld

When he or she stops copying software illegally. Software houses that abuse the copyright of others should be dealt with just as severely as individuals, if not more severely. Maybe ELSPA might include a few clauses in a members' charter that clearly states that no member company will ever use illegally-taken back-ups? People involved in the games industry should be making every effort to clean up their act. You two guys should have contacted FAST or ELSPA.

H F-W

Criminal method

I am a pirate. (I hate that word.) I swap games with others, but do not sell them. This is wrong, but I refuse to believe that it is any more wrong that copying a new album or videoing last night's *Brookside* – both illegal.

You often compare pirating with stealing (That's because it is – H F-W) If I go round to my friend's house and steal his new album, this is clearly very different to going round to his house and copying it, as I'm sure would be blatantly obvious to my friend. Please notice the difference. My method does not require the original to be physically moved. This may seem to you to be pedantic – after all it's still illegal, isn't it? Sure, but if I shoplift, I'm not jailed for life, am I?

'Power Lord'

I do get tired of people who wibble on trying to defend their pirating actions by saying their crime 'is not the same as' some other offence. Eating soup is not the same as eating a sandwich, but it's still eating. I bet you could go into the local school playground, punch a five year old in the arm and make him cry – it's 'not the same as' sticking a knife into someone's back on the football terraces, and you probably wouldn't be jailed for life if you were caught – but it's still assault, and it's still anti-social behaviour. I don't like people like you.

Your 'method' of theft means you don't rip off your mate by stealing his copy of an album or game – you just rip off the artist or programmer instead. It's nothing to be proud of.

H F-W

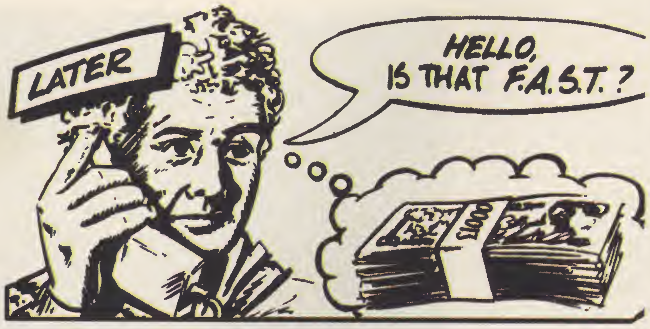
Pirates pirated?

The software houses are as guilty of piracy as anyone else. How can they slag off pirates and then use the utilities we write? Some companies use packers written by pirates for pirates – like the *Automation Packer*, *Jet Packer*, *Pack-Ice* and so on. All these are pirate utilities, though *Pack-Ice* is public domain now. If they weren't packed, they'd be on many more disks than they currently are, and you can thank pirates for that!

Pirates have done a hell of a lot for the industry. The ST and Amiga wouldn't be anywhere near as successful as they are if it wasn't for people buying them secure in the knowledge that they can get any game they want from friends, with no fear of paying £20 to £30 for a pile of crap.

Pirates do NOT spread viruses. Quite where that idea came from I do not know. Most virus killers are written by pirates – would we really want to risk destroying large collections of games?

And pirated versions of games are often far superior to the originals. Witness a version I did of *F19 Stealth Fighter* – on one disk, no disk swapping there! And on a 1Mb machine, it loads into memory all in one go. Surely such simple improvements aren't beyond the skills of programmers. I've even done a version of *F16 Combat Pilot* with the bug that stops you completing it fixed – just try finishing the original, it will reset when you reach the last squadron. And I know of games fixed by pirates so that they work on every version of TOS, that load faster, that save high-scores when the original did not...



• From the ELSPA campaign aimed at bringing pirates to justice. Just dial 0386 833501...

Contrary to what you say, cracked games are not badly hacked efforts covered in swear words. Some are, but they are not the majority.

Piracy will always exist. The average protection scheme doesn't even slow down a cracker like myself... Rob Northern makes me laugh out loud whenever he updates his protection! And, by the way, if there was any single thing that stopped many games working on the STE it was Rob's protection. Or didn't anyone notice that cracked version of games protected by him worked perfectly on STEs?

Wake up to the fact that that the majority of your readers are pirates and will be until prices are at a sensible level. If software houses put the prices down, they would get more sales. Well done to companies like Digital Integration for their cheap games, even if they are re-releases. The pirate group I am in does not pirate budget games – so tell that to Bob Hay: budget software gets pirated less than full price.

'Alien' of the Pompey Pirates.

It's a shame you are misdirecting your talent, pal. My next two correspondents say all I want to say to you, 'Alien'.

Matching the quality

Pirates claim that they only copy software because it isn't worth the price, and they moan constantly about the quality. I have seen, as almost every 16-bit owner has, the hacked-and-packed type of pirated disks. Often the demos which are placed at the beginning of these games are far better than the games themselves, by which I mean the quality of the coding is much better. To get to the point, if these people complain about the quality, then they should have a go at bettering it, in other words – writing their own software. Until then, their excuse is rather weak.

Tom Kirby Green, London

With friends like these

Do all those coders who 'crack' computer games ever intend to produce anything more purposeful than boring demos in which they usually just send their 'special greetings' and 'normal greetings' to all the same people? If not that's a shame and a waste of talent. If, however, they do produce a game and it gets marketed, do other coders crack the game and spread it all over the world so that (relatively) few originals are sold? The people pirating your software are the people sending you their 'special greeting'. Nice friends.

D. Reigate, Surrey

Getting your backup

I was appalled by what I read in *Express* 107, both in Front End and in the letters column. Evidently, neither Haydn Fitz-Williams nor anyone in ELSPA have any practical computing experience to speak of, or they would be aware of the vast difference between piracy and backup copying – and the vital necessity of the latter.

As anyone knows who has done very much computing (especially programming, which is far more disk- or tape-intensive than just booting a game and playing it for hours), magnetic media are far from indestructible. Indeed, as if the standard ills of disks weren't bad enough, we now also have viral infection to contend with.

If backup copying were standard practice among micro users, as it is among mainframe users (where I got my first experience of computing), such disasters as the breakdown of C & VG's Seventh Empire PBM, or Derek Brewster losing the entire source of one of his games (I forget which) and having to start again from scratch, would never have happened.

Admittedly, the situation has been confused by some pirates using the term 'backup copying' as a euphemism for their activities, just as some non-electronic thieves refer to their activities as 'borrowing'; this does not mean that borrowing is equivalent to theft, which in effect is what ELSPA (and HF-W) are saying.

Maybe, in some distant future, EPROMs will become cheap enough (and dense enough) that all new machines will have built-in EPROM blower/readers instead of disk drives, and backup copying will at last no longer be needed. (Provided, of course, that publishers have the sense to provide software in mask-programmed ROMs which can't be erased!).

Until then, there will always be the foolish users who curse because they've just accidentally trashed their only copy of their favourite £300 utility, and face a long delay before they can get a replacement from the publisher (always assuming, of course, that the publisher offers this service, and hasn't gone bust in the meantime): and the wise users who smile, knowing that all they need to do is re-generate the backup (for that is what they just trashed) from the master, which is kept solely for that purpose, and they can be up and running again in a few minutes.

I've long felt that the answer to piracy is not more legislation (when was any problem solved simply by making it illegal? If that's the answer, why don't we make poverty illegal, so that we'd all be millionaires?), nor by ever more draconian protection which simply makes life more difficult for the legitimate user (anyone remember the Lenslok fiasco, or the scheme involving a hole burned in the disk which Lotus was forced to abandon when it started getting repair bills for the drives wrecked as a result?), but education – and ELSPA are the ones in the most urgent need of such education at present.

Robert Baker, London

Sure, taking a backup is a sensible precaution and many publishers specifically allow you backup software in the licence agreement they issue with packages. And proposed EEC legislation will only allow back-ups to be made "where it is necessary for the use of the program by the lawful acquirer in accordance with its intended purpose, including for error protection." But as things stand now, unless the owner of copyright material grants a licence to copy the work, then taking a back-up is a clear infringement of the 1988 Copyright Act

Backing up your software for your own security and backing up your software so you can give or sell 'spare' copies are two very different activities. ELSPA's line on the matter is that its members contend that their programs do not need a back-up to to enable them to fulfill the 'intended purpose', and that leisure software is not sold with a licence to take a back-up. So, in copying a game, for whatever purpose, you are infringing the law as it exists.

Backing up your own work-in-progress on a regular basis is not just good practice – it is an essential part of using a computer efficiently, whether you are word processing or writing code. But as the originator of your own work, you hold the copyright and can do what you jolly well like with it... a different matter altogether to backing up someone else's work without their permission. H F-W

Cyber terror a reality says US

The influential United States National Research Council has warned that future terrorists will be able to do more damage with a computer than with a bomb.

In a report on security entitled *Computers at Risk; Safe Computing in the Information Age*, the council says terror groups could cost more lives through abuse of computer systems than through established methods of insurrection.

It warns that attacks on sensitive computer systems could cause national disasters, corrupt election results and bring disruption to banks and economic institutions.

The report points out that as countries become increasingly dependent on computer networks, they become more vulnerable to attack. This is especially true of nations which interconnect networks.

It has called for a strict code on computer security, a method of teaching computer ethics, and a training scheme for 'computer guardians' who could thwart terrorism in the future.

The report continued : "National exposure to safety and security catatrophes will increase rapidly unless there is immediate and determined action." ▨

Apple predicts Euro boom

Following an excellent fiscal year in Europe, Apple has announced plans to expand its manufacturing and distribution functions across the continent.

The company sold $1.5 billion worth of kit throughout Europe during the past 12 months, a 28 per cent increase on its 1989 performance. Europe has become Apple's fastest growing world marketplace.

Speculation is growing that the company will throw open its distribution doors and allow low cost models, such as the Mac Classic, to be sold through normal retail outlets. This is being vehemently denied by the company, which currently sells its kit through licensed Apple Centres.

A spokesperson for the company stated: "The tremendous success of our new products is showing us that our strategy of reaching many more people with the Apple Macintosh is working."

Sales of the Mac in Europe now make up nearly 30 per cent of the company's total corporate revenues. ▨

An American multi-player gaming centre that could become

LONDON DEBUT FO
INTERACTIVE VIRT

A massively interactive, multi-player computer gaming centre will be opened in London within the year, *Express* can reveal.

The Virtual World, which is already wowing residents of Chicago, allows up to 16 people to play with and against each other at the same time in the same game. Play takes place in a huge real-time computer game called *BattleTech*.

Would-be cybernauts sit inside one of 16 cockpits featuring two joysticks, two foot pedals and a computer display. *BattleTech* is set within a 100 square mile computer-generated terrain which gamers explore, while carrying out battle orders.

In the science fiction fantasy everyone plays individual, thirty-foot-high military robots, each with specific orders. The effects of travel through the virtual universe are cumulative. If, for example, a player destroys an obstacle such as a tree or rock on his travels, the next player to pass through that sector will find nothing but a crater.

You can play as a team and it's possible to communicate with allies through microphones.

The first Virtual World was only opened in Chicago in August. But the owners say that it has been such a phenomenal success that plans are afoot to open new centres in Washington, New York, Florida, Los Angeles, London, Paris and Frankfurt.

The project is run jointly by American board game manufacturer FASA and a construction company. FASA's president Jordan Weisman told *Express*: "It's been so successful that we've had an average of 500 people play every day since we opened. We had wanted to do this for years. Now the plan is to open ten new centres next year, possibly through franchising deals. I definitely want to open in London before the end of 1991."

He claimed that centres such as Virtual World could become the future of family entertainment outside the home.

Virtual World is open during normal socialising hours, so people can pop in for a game while out on the town. It costs between $6 and $8 for half and hour depending on the time of day, and parties can book in advance. UK prices could be as low as £3 or £4 for half an hour.

Once into the Centre players are offered the chance to view more experienced gamers at play. Then they enter a 'Ready Arena' where battle orders are given out over video monitors.

The actual 'Launch Bay' features 16 cockpits each complete with hundreds of controls and options. Gamers can make use of more and more controls and weapons as they gain experience.

Publicity director Nick Morris said that many players kept coming back for more and were "hooked". FASA also plans to deck out the Virtual Centres with a variety of games. So, in the morning there could be a *Star*

• *Hundreds of options and weapons for those with experience, but beginners can get by with simple controls.*

• *Watch other people play at observation points.*

• *Battle orders are given out in the 'Ready Arena'.*

come 'the future of family entertainment'

FOR AMAZING RTUAL WORLD

Wars style space battle, followed by a fantasy adventure and *BattleTech* in the evening.

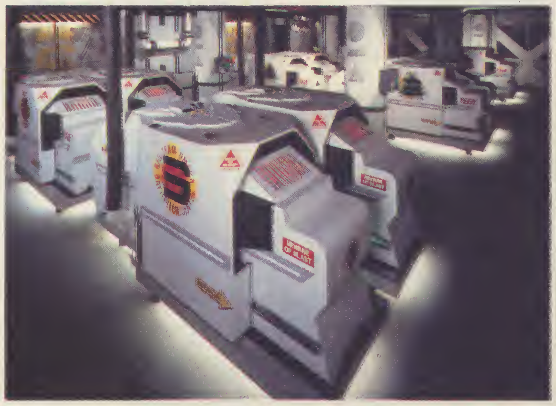
PC gamers can already get hold of a non-interactive version of *BattleTech* from Mediagenic, but the real thing was programmed by Incredible Technology of Illinois.

The game runs on four computers, designed by an offshoot of FASA called Environmental Simulation Projects, which offer gamers a 'multimedia' environment including graphics, sound and on-screen game information.

Weisman added: "It's like interactive theatre. You are given an empty stage and you can go anywhere within it, creating the plot as you go along."

FASA is hoping to court a British entertainment consortium big enough to be able to buy up an empty warehouse in London and convert it into a Virtual World.

Weisman says the experience gained from the original Chicago site, plus the extraordinary success of the project, will tempt plenty of franchise bidders. ▨



• Top right – 16 cockpits are interlinked for fully interactive game play.

LIVES:01 HIT:25 SCORE

• Right – Destroy your friends in Virtual battles.

RED TEAM
ALPHA
BATTLETECH CENTER

• Although you are completely cut off from the outside world you can still talk to team mates through microphones.

GAME GEAR
SEGA

•Sega GameGear: official launch in six months.

GameGear to get Virgin treatment

Sega's hand-held games machine the GameGear will be officially launched in the UK by the middle of 1991, it was confirmed last week.

UK distributor Virgin has reacted positively to Atari's drastic price cut on the similar Atari Lynx, and both machines are likely to cost the same. The Lynx currently retails at £130.

Stocks of the Sega hand-held have only just begun to trickle into the UK, with less than half a dozen grey importers selling the machine. Virgin Games boss Nick Alexander says that, after a shaky beginning, hand-helds are beginning to gain popularity.

"They're definitely getting a head up of steam," he commented. "The Nintendo Gameboy is improving here after a disappointing start, and we already know that there is a demand for the GameGear."

He slammed Atari's Lynx for being "a very ungainly thing" adding that it "hasn't the same sort of sexiness" as the GameGear. "The difference between the two products is like the difference between CDs and cassettes," he claimed. ▨

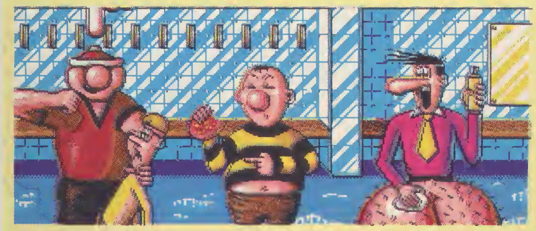
PC big guns back multimedia

A multimedia standard for the PC could be established following an announcement from Microsoft's that it will be launching a multimedia version of smash hit operating environment Windows 3.

And two big name PC manufacturers, Tandy and Zenith, have announced plans to launch 'multimedia PCs' incorporating powerful CD-ROM players with a Windows-based environment. IBM is also understood to be working on a similar project.

Seven major manufacturers have applauded Microsoft's announcement including Olivetti, CompuAdd, NEC and AT&T. The companies want products incorporating and mixing text, graphics, video and sound will be inter-compatible.

Microsoft's Multimedia Development Kit will be published next year aimed at software develpers wishing to exploit this new area of computing. ▨



Oh no, it's the pathetic game

Virgin (Snurf, fnarr, fnick!) Games can at long last bring joystick wagglers (Groo! snick, fnarr!) *Viz: The Game.*

The game revolves around a race between three of the mag's best loved (!) characters: the perfectly plummed Buster Gonad, the pootingly pungent Johnny Fartpants, and that doyen of the Royal Ballet and Newcastle General Hospital, Biffa Bacon.

Race commentary is provided by the incomparably articulate Roger Mellie, introduced by Roger 'peachfuzz is a standard O/S for John Craven's throbbing 16-bit SAM Coupé' Irrelevant.

Viz: the Game could be the biggest thing Virgin has handled for a long time. It will be releasing all 3.5 inches of it to ST and Amiga owners in January 1991. Price is £24.99. ▨

NIBBLES

- Cheap Macs call for cheap software, and you don't get much cheaper than free. That's what a fully working demo of Steinberg's *Cubase* MIDI software system costs. All you need is a Mac with 1Mb of RAM. Call suppliers, Evenlode Soundworks Ltd on 0993 898484. Or write to: Customer Support, The Studio, Church St, Stonesfield, Oxford OX7 2PS.
- Fujitsu has just announced the launch of a new , one inch high, PC compatible 3.5-inch hard disk. The M2616 allows 105Mb (formatted) of storage. It has both SCSI and AT interfaces and is aimed at manufacturers of compact 286, 386 and portable machines.
- Funky young software house Renegade has strengthened its position by signing a distribution deal with Mindscape. Releases are expected early next year.
- *Protext* is in the news again. The release of version 5 has lead Arnor to upgrade 4.2. Version 4.3 comes with pull-down menus, dialogue boxes, block dragging with mouse, and file selection. While *Protext* 5 costs £149.95, the upgrade to 4.3 costs £99.95. Call Arnor on 0733 68909.
- Virgin Games has signed a publishing deal with software developers Graftgold, the team responsible for *Super Off Road*, and *Simulcra* among others. In 1991 they will be bringing us *Realms* , an RPG which makes use of 3D fractal technology.
- Three new clip art packages are to be launched for the Amiga. The packs include images as diverse as human skulls, helicopters, and patterns. The Human Biology pack is £25.00, Transport pack £15.00, and Talking Turtle pack £19.95. Contact Think Limited at Prudential Buildings, 46c High St, Erdington, Birmingham B23.
- Toshiba has cut the price of all its portable computers by 15 per cent. The company claims to have 60 per cent of the UK portable market, and sees demand rising by 20 per cent over the next year. Panasonic, another major Japanese player, has cut the prices of three portables; the CF-150 by £60, the CF-170 by £465 and the CF-270 by £404.
- A new software package for the PCW has been announced by Whener Isle-of-Man. *Utilities 1* is said to provide full printer and screen control, as well as introducing users to "the fascinating world of Resident System Extensions". Price is £34. Contact Wehner at 37b New Cavendish St, London W1M 8JR.
- New high quality PC colour monitors will soon be available from Taiwanese PC maker Acer. The AcerView range of monitors are said to use automatic multi-scanning technology which allows for connection to existing colour applications. Prices range from £399 for the 14-inch AcerView 31 to £598 for the AcerView 35 which uses Sony's Trinitron technology. Call 081-569 2978 for details. ▩

American games could soon be available in the UK

BRITISH CRACK NINTENDO CHIP

An little-known UK computer company plans to do what Atari Games, under the guise of Tengen, has been unable to – take on Nintendo and win!

Unitec Systems claims that it can convert unreleased American Nintendo Entertainment System cartridges for the UK.

It achieves this via a 'master chip' of its own development which, it claims, will override the lock and key security system built into cartridges for the NES.

This comprises two chips; one in the cartridge the other in the NES unit. Both have to be made for the country in which they are sold, otherwise they will not 'fit'. So cartridges presently available in the USA, such as *Super Mario Brothers III*, will not play on UK machines.

Unitec plans to replace the official key chips in the NES cartridges with its own master chip. These confuse the NES locking chips into believing that they are playing UK-sourced carts.

This means that Unitec could grey import games such as *Teenage Mutant Ninja Turtles II* a year ahead of Nintendo.

A spokesman for Unitec told *Express*: "We have 3,500 cartridges stocked and converted for the UK at present and a massive New Year shipment ready for dispatch from the US."

The company also plans to sell the US chips taken from the machines into Japan.

More grandiose plans are afoot; a spokesman for Unitec boasted: "We are now in a position to offer software houses the method to write and produce games via our cartridge and chip for release in the United States. It's a hell of an offer since the programmers on the C64 are experts in 6502 Nintendo code."

He claimed: "Nintendo knows what's going on, it just hasn't done anything about it."

•NES: UK users could get their hands on pre-release American games.

However, Unitec's move could infringe Nintendo's copyright. The Japanese super-company will no doubt point out that any method of selling American games in Europe means loss of revenue. Although Unitec claims to have developed the master chips in the UK without pirating Nintendo's hardware, the game code itself belongs to Nintendo.

Nintendo is already involved with Tengen in a $100 million law suit and has a history of protecting its interests at home and abroad. The company has declined offers to comment on this latest attempt to loosen its iron-fisted handling of intellectual property. ▩

Cheaper chips are marketable

A company called Terrabyte is buying computer chips in bulk on the international commodities markets and selling them on to end-users.

The idea is that buying in bulk at fluctuating market prices will allow Terrabyte to pass on low cost chips. An example from the company: 4Mb SIMM chips which would normally retail at around £250 for £115.

For more information call Terrabyte on 0865 794848. ▩

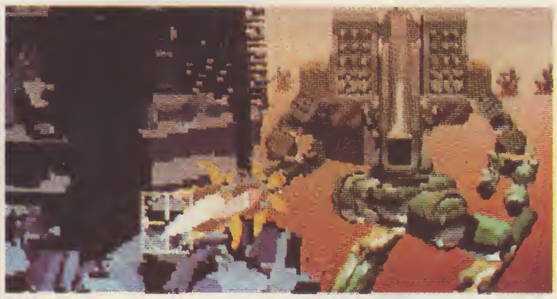
• Rolls Royce: computer aid

Computerised Rollers

Up-market car maker Rolls Royce is set to transform its manufacturing operation with the help of a massive new computer network.

Last week production at the company's Sunderland plant went over to total computer control with 40 Sun Workstations linked. They will monitor the movements of car components around the factory and reduce the production time per car.

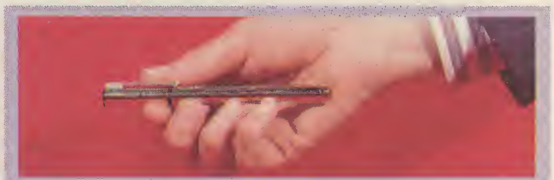
The Ethernet based network, installed by Rolls Royce's own computer company Reflex, has been in beta-testing mode for the past 18 months. ▩


• Sword of Sodan: Oh dear, the walking dead are back again.

Megadrive zombies

Yet another Amiga favourite has been converted to the Sega Megadrive. This time it's 'slash-the-weirdos' extravaganza, *Sword of Sodan.*

Electronic Arts' chunky graphical game of swordmanship and hand to hand fighting pits you against putrid zombies, insane warriors and swarms of highly unpleasant insects. You'll have to pass through seven levels including the Zombie Graveyard and Bridge of Spikes. There're the usual magic potions and mystical powers but, best of all, EA is promising "buckets of blood". Its out any time now for £39.99. ▩


•Gadgeteers will love this: the world's smallest laser pointer. The size of a pen, it weighs one ounce and will fire a ced beam up to 150 metres – which could point out details on large projected displays. The Laser Pen Pointer runs on two batteries and costs £149. Call 071-387 3399. ■

Video titling software comes to PC

PC owners are to be given the chance to muck around with video titling software, thanks to Maze Technology.

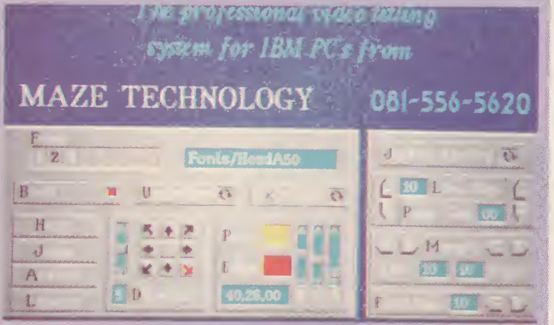
The firm has launched *PC-Titler* which, it is being claimed, can "compete fully with Amiga based systems".

The PC isn't generally known for its video production capabilities, but Maze says the increasing availability of VGA cards and genlocks could see the PC take over from the Amiga next year.

Managing director Owen Cullum said: "The Amiga has had a three year head-start but these are very different platforms. *PC-Titler* is very different from Amiga based systems, but it can do things the Amiga finds difficult, like smooth scrolling of very large titles. The Amiga also has some strange quirks and crashes a lot. This is easier to use and more consistent."

PC Titler costs £199 and will work on any PC with a VGA or EGA card and genlock.

For more information call 081-556 5620. ■



•Video trickery on the PC.

Full colour LCD screen a seen as a firm possibility

ACORN ARCHIE GOES PORTABLE

Acorn has confirmed it will be launching a portable based on the Archimedes next year. The company's Cambridge development centre already has a working prototype.

Sales and marketing manager Mike O'Riordan said that a RISC-based machine would be appearing in the near future with an official announcement due in February. But he refused to comment any further on the matter.

We understand that the new Archie does not have to be plugged into the mains, but hard technical specifications are being kept secret. Central to the company's portable policy will be the display.

An Archimedes portable in any configuration will not be cheap and Acorn may decide to go the whole way and launch with full colour LCD screen.

It's thought likely that the machine will be based on the ARM 3 chip which is both fast and boasts low power consumption.

An independent hardware developer has already rejigged the Archimedes to fit inside a portable box. London-based Mike Harrison has been working on his project for two years, but says he aims to produce Archie portables to individual orders.

Acorn are hoping the education community, traditionally its strongest sector, will react enthusiastically as this will decide the success of the machine. ▒

• Archie: portable pretensions.

• Navy Seals: *out now for the GX4000, 464 Plus and 6128 Plus.*

Ocean's Navy Seals lead console charge

Amstrad, along with a number of well known software firms such as Ocean, Domark and Titus, has announced the release of 16 games for the GX4000 CPC console – as well as the 464 Plus and 6128 Plus computers.

Titles launched this month include *Navy Seals*, *Wildstreets* and *Dick Tracy*, followed early in the New Year, by (among others) *STUNRunner*, *Copter 271* and *Panza Kick Boxer*.

But for the real smash you'll have to wait 'til February. The list also includes arcade hit *Double Dragon*, from Ocean, which is likely to be the biggest attraction for CPC gamers. ▒

Read (and re-read) all about it

***The Independent* and *The Independent on Sunday* newspapers are to be released on CD-ROM next year.**

The quarterly updated disks will contain some 450 issues of the journals, equivalent to 15 months worth of broadsheet reading. Also available in this form will be papers dating back to 1988.

Each CD will cost £299, or £499 including a licence to receive updates.

The publishers of both the CD and the newspapers claim that this is the first time a national newspaper has been released in digital form, but this is being contested by both *The Times* and *The Guardian* which have announced similar plans. ▒

Network flies cheap PCs from States

PC importer Network News is to launch a full line-up of IBM compatibles at "American prices".

At the top of the new Network range, costing £1,500, is a 386SX with 14-inch VGA colour monitor, 40Mb hard disk and 8Mb on board. A 286 with the same spec (but only 4Mb) will retail at just under £1,000.

Network's boss Frank Sheen claimed: "We're manufacturing these machines in Dayton, Ohio and bringing them in. Prices are much more sensible in the US. Here, they're a rip off." ▒

NIBBLES

- Compo Software the "highly successful European specialist ST software house" is coming to the UK. It already has bases in Holland and Germany, and is looking to sell a new word processing package, *Write On*, which is aimed specifically at the UK market. For more information call 0480 891819.
- Want to work with information technology in Europe? A new magazine called *Informatika 12* has just been launched and will contain details of IT jobs throughout the European Community. Distributed to 500 educational institutions, it can be used as a local or Europe-wide recruitment medium.

For more information call 071-724 3615. ▒

THE WEEK IN VIEW

'I think therefore IBM'? Not any more surely? Arnor's marketing man, Douglas Thompson, says you shouldn't be badgered by Big Blue.

When buying computer software, some buyers (mainly large or multinational companies) look at the price of the software first, then they look at what they get for their money. If they are looking to buy a spreadsheet, word processor or database program and it is under £500 they will probably be very sceptical about buying it.

As you and I know, the best way to buy software is to work out what you like your software to do and how much you can afford to spend, then go and see what is available. When you have finished your market research, you will be happy that you have made the right choice and got the best that you can afford to meet your requirements.

Some companies do not work in this way, they say we need a piece of software, here's £xxx, go get it. Some companies are even worse, each department has a different computer and different software, so it is very hard or even impossible to transfer information from one machine to another. This I put down to a lack of planning and thought before the software and equipment is bought.

Let me quote you an example told to me by a friend of mine, who works for a large local company on the design and testing side. They were told they had a budget of £10,000 to buy a computer, design software, database, printer and communications software/hardware to enable the computer to 'talk' to the mainframe computer.

After three months of market research my friend had found that the Apple Mac system suited their requirements and came within their budget. So off my friend proudly goes to the computer buyer to get his signature on the order. The buyer takes one look at the order and sees that the computer is not an 'IBM' computer (or even a compatible) and rejects the order, saying that the company only buys IBM computers. My friend then spent two hours telling the buyer that the IBM did not have the software available, but it did not do any good and therefore they did not buy the computer or software and stayed with their manual system. So much for modern technology and progress!

I would like to say to all company buyers of software and hardware, do not judge the quality of the product on the price alone, do look at the specification. If someone has spent a number of months investigating the market and finds what they need, listen to them. Don't be afraid to get a different piece of software or different make of hardware, as the computer industry is changing very quickly. If you do not get the best that you can afford, your competitors may become more efficient than you and take some or all of you business away. How are you going to explain that to the managing director? ■

Express Access

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AT YOUR NEWSAGENT ON THE 20th

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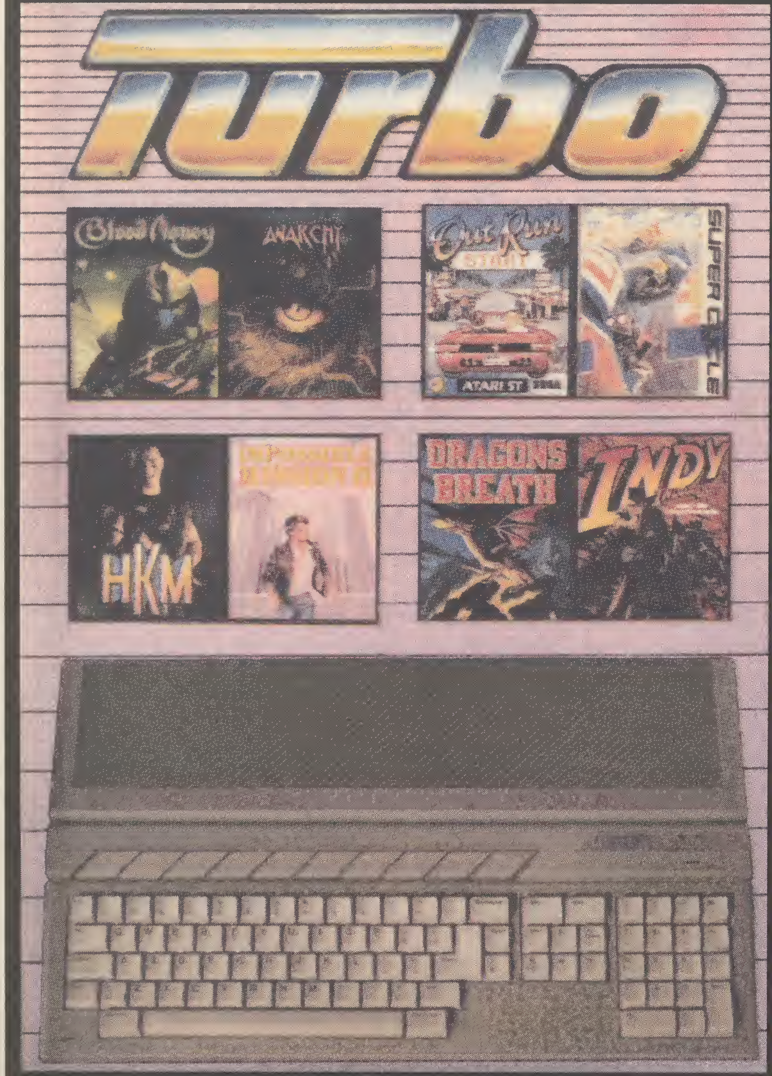

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■ Gold star seeker

I enjoyed your Christmas Gamers Guide, since all Commodore's offerings got rave reviews.

One small problemette which may have confused readers occurred with the C64 review. Mindbenders and Nightmoves are not two separate bundles – it's just one mega-value double-headed pack.

I wonder if your writer had realised this at the time whether or not the pack would have received your Gold Star accolade of best buy like the Amiga.

Andrew Ball, Commodore

Glad you liked it Andy – but despite the apparent confusion, I'm afraid the answer is 'no' – according to our panel the CPC still wins out – it comes with a monitor and currently offers slicker cartridge games.

H F-W

■ Etymologically speaking

I have just read Samantha Clements' letter and your response. In my early secondary school days – late 1950's – the adjective prat (sometimes spelt pratt) was taken to mean the part of the female that attracted the male heat-seeking missile.

In recent years though, this word has seemingly become sanitised enough to be used in the script of Coronation Street by one of young Tracy Barlow's schoolchums no less.

I feel that this world has now reverted to the original old and middle English use. Prattling on, eh? A prattler is a crashing bore, we all know. It is to be found in the Dutch language. Praat or praten is the verb to talk, as opposed to spreken or spreek, meaning 'to speak'. The common Dutch expression for a chatterbox is ' ouwe praatjes' – literally 'old little talk'.

David Copping, Polegate, Sussex

'My Rude Word Is On More TV Shows Than Your Rude Word', eh? My next correspondent has some rather different points to make about Samantha's letter...

■ Macho posturing

Samantha's letter was quite interesting, but I feel I can put the teacher's point of view, and perhaps that of the boss.

About 40 per cent of the people who I have attempted to teach computing have been women. I would not be able to teach on courses such as Teesside Polytechnic's Women Into Information Technology course because I am a man.

Most people wanting to master something such as computing need a little personal tutoring at difficult stages. At the end of any teaching session my blood runs cold if the last remaining students are a woman or two.

Until our society can rid itself of the idea that men are ravening sex maniacs, women students and subordinates are not going to be able to get the sort of help and encouragement they need to succeed.

As a single man, I have even had married fellow lecturers suggest that I may only be in the job for the girls. If I get a bit cross about some apparent lack of co-operation, I also get 'Oh, if you had kids of your own you'd understand'. Understand why a chap has to be away from work in order to defend his daughter's honour?

A major source of discouragement to women in professions comes from mothers and aunties who – in a world where domestic chores were once far more difficult than today – made careers out of being housewives.

Richard Robson, Teesside, Cleveland

Hmm. You seem a bit bitter and twisted Richard. According to the person who was the course administrator for the Women Into Information Technology course which ran last year, lecturers called Eddie, Paul, David, Bob and Peter were part of the teaching team. Sure, it is a women-only course as far as the students are concerned, and sure the Course Tutor is female, but five of the lecturers were men.

Which rather leads me to discount the rest of your letter as little more than a chauvinistic, bigoted rant. Perhaps some rather more informed and enlightened readers might like to write in with their opinions on the opportunities for women in computing. I don't want to hear from you again, that's for sure.

H F-W

■ TV moan

There are no computer shows on television because television companies have got the wrong approach to them.

All they have done in the past has been to concentrate on the general uses of a computer with, perhaps, general references to individual machines. So, we end up with a series of programmes with one week on word processing, one week on DTP and so on.

It seems to me that the parallels between the computer world and the record industry should be exploited by television. Buying computer games is not that different to buying records. We wouldn't expect the record industry to be dealt with exclusively on television by a series featuring rock music one week, opera the next and so on.

Games reviews, a look at the more popular current games and an audience-

■ Orderly points

I've got a few points to make. So here they are in order:

1) Why does the person you claimed to be Tim Smith in *Express* 108 not have a beard? I met Tim on the Atari train and he definitely sported a fine face of hair. Not to mention the fact that he didn't look very much like his supposed photo, in any case.

2) What is so wonderful about Fourth Generation Languages? They may be simpler to program in, but when it comes down to it, all they do is compile slow, sloppy machine code. Give me a good assembler any day.

3) Another 'Mine's Better Than Yours' debate coming up: how about 'My Computer Has More Things Wrong With It That Your Computer'? To get the ball rolling, my Beeb regularly turns itself off (dodgy power supply), a good thump to the side being the best remedy. Not only that, but if you attempt to move the computer by more than a few centimetres the monitor screen turns yellow, green or blue depending on how the Beeb's feeling, and sometimes even wobbles up and down.

4) Congratulations to Keith Pomfret on responding so well to the criticism of his Amiga-biased views. My opinion of him has risen considerably over the last few weeks and I now rate him as a worthy successor to Uncle TechTip.

5) Can you please put a stop to all these letters whingeing on about how the 'MCIBTYC' 'debate' should be stopped. They're very boring.

6) That's it. Bye.

Rafael Jay, Bath, Avon

*• **Express** is not liable for any injuries incurred as a result of sides splitting while viewing this photo.*

1) Can't a man get a shave?

2) Your choice, pal.

3) Get it fixed, idiot.

4) Pop down to the office, buy Keith a beefburger with double fries and he'll be your friend for life.

5) Yes

6) That's it. Bye.

participation section where games players can challenge each other (as in the arcade rounds featured in 'First Class') would, in my opinion, be perfectly acceptable as a format – a sort of cross between *Juke Box Jury* and *Top Of The Pops*.

Imagine it. Welcome to the Pick Of The Pixels, in which top games jock Tim Smith gives you a run down of all the new releases and this week's Top 40 chart of serious and leisure software.

Why not? It's got to be more entertaining that another sixty hours of peak-time snooker!

Kevin Patton-Smith, Scarning, Norfolk

Unless you are a snooker fan, that is Kevin. I quite agree – but TV companies just don't seem to be able to catch on to the potential of a computer game show, even with all-night TV and lots of slots available for 'minority' issues. I just hope you are not advocating sixty hours of peak-time Tim Smith!

H F-W

■ Opening new doors

I wonder how many of your readers are over 50 and have bought a computer for the first time?

I am, I did, and I find it an interesting hobby, even though I feel like a fish out of water. To start from scratch at 52 with an Atari 520 meant I felt out of my depth and wondered if I should have started with something simpler.

My first year has been a time of discovery and wonder, with a slight regret that working in a car factory for 32 years I did not take an interest sooner – but my only interest was bringing my family up. But it's never too late to start a new hobby, and though I haven't really achieved much with my computer yet, I have had many good hours experimenting, playing games and so on.

It would be interesting to know if any other readers started late in life, like me, and if so how they have fared. And wouldn't it be great if we could have a column for the 50+ readers, strictly for beginners so that we can get to grips with our machines. I'd love to hear from any of your readers.

C A Harris, 3 Wilcote Road, Headington, Oxford OX3 9NG

I have always said that it's not which computer you start with, it's the fact that you start with a computer that's important. Whether our illustrious editor will wear a column dedicated to the interests of the older reader remains to be seen, but we are certainly planning a series of 'back to basics' features – like the ones we recently ran on 24-pin printers and hard disk drives.

If any of our older readers would like to drop me a line with their computing stories – preferably with snaps of themselves or their set-up – I'll collect them together and get a petition to the great Andy S...

H F-W

■ More SAM

The SAM's software base is at last growing, although you haven't mentioned it. Now available are *Football Director II, Defenders of the Earth, Famous Five, Pipemania, Mind Games I* and *II, Sam Strikes Back/Futureball*, and *Sphera*. Imminent titles include *Kick Off II, Klax, Xybots, Trivial Pursuit*, and *Escape From The Planet Of The Robot Monsters.* All these games are SAM-specific. And I look on it as a bonus that I can still use all my old Spectrum software (and transfer it to disk easily).

Hardware is also appearing regularly – your news pages cover all sorts of rumours of impending releases of kit, some of which is six months away.

I realise it's not worth your while to keep on so many machine specific columns, but at least let's have some news coverage. The SAM is a British-designed, British-built machine, and there are things happening.

John Hawkins, Hastings, East Sussex

Well yes, things are going on. I was recently reminded that I should cast my mind back a while – twelve months after the Atari ST was launched, there was less ST-specific software available than there is SAM-specific software a year after the Coupé's launch.

But so far, no-one has send me a recorded delivery letter giving details of product launches for the SAM. Maybe SAM developers just don't read my letters pages. (Sniff!)

H F-W

■ Misunderstood?

Your article on the emulation explosion in *Express* 108 made interesting reading – there is never enough stress given to the advantages of using your Amiga, with all its superb capabilities, as a PC instead of buying a bargain-basement PC as a second machine which, besides taking up extra space, is only a monochrome cheapie.

But your hard-working reporter was misinformed. All the updates to the KCS Power PC Board are in the form of software, and they are all available – including the upgrade that allows you to access a hard drive – to all our customers. If someone already has the board, we will make a nominal charge – just call us on 091 490 1919 for full details.

And I'd like to take issue with the way you awarded stars on performance in the review. Features, or specification you can argue with, but seeing as you have not tested the Vortex ATonce, how can you award stars on performance?

Come on – be fair!

Jack Kaufman, Bitcon Devices

It does seem as if Keith Pomfret was misinformed – he wrote what he wrote as a result of a conversation he had with KCS developers at a recent show. But now the record is straight on that one.

As to the performance point – well Big K has evaluated the ATonce board. Indeed he has one installed in his Amiga at home. It's just that he hasn't written about it in depth in *Express* yet. It seems that your interpretation of the meaning of the word 'performance' differs from Keith's; he was aiming to give an overall rating, and he says the multi-tasking capability of the ATonce won it that extra star.

H F-W

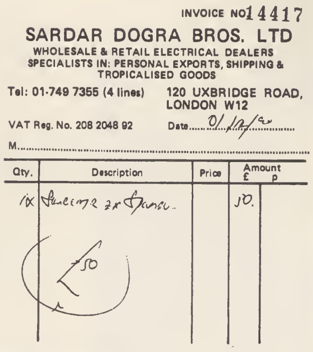
■ Bijou and compact

I have a Spectrum Plus that's on permanent loan to my mother, who plays the bundled *Scrabble* game that came with it, and a Spectrum Plus3 that's in storage because my bedsit is so small that it can't be fitted in with the Amiga that I have.

This morning, I walked in to a HiFi shop and bought a rubber-keyed ZX Spectrum for £50 complete with box, books and leads. They wanted £79.50 for it, but reading the *Express* readers adverts column every week I knew £50 was more than generous for an ex-demo machine.

But why did I buy it? Because it's small size means I can store it away easily and use it as a laptop – space really is at a premium in my room. On the way home I bought an adaptor for my personal stereo and in a short time had the thing fired up and running.

I may not have got the best computer this Christmas, or the biggest collection, but I am sure I have got the cheapest one bought retail. No photo can be arranged, but some documentary proof is enclosed.



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D G W Griffiths, London

Well you are right on one count – yours in not the largest collection of computers on record. But using the Spectrum as a console is certainly a smart idea – there's life in the old rubber-keyed wonder yet.

And what exactly are those 'tropicalised goods' that your retailer specialises in? I think we should be told...

H F-W

MAIL SHORTS

■ MCIIMTVPTYC!

To add to the 'My Computer Is In More TV Programmes Than Yours' debate: my PC is in more than any other computer. To name a few: *Howards Way* (every office), *Capital City, News At Ten, Daytime Live, Cartoon Time* (Rolf Harris, so I am told!).

Now PC owners have won, can we put a stop to this 'My Casio Watch Is Better Than Your Mainframe' stuff?

Ian Hurst, Wigan

'MCWIBTYM' eh? Well, I've avoided giving away any fivers this week. So I'll offer a tenner for the best list of top ten 'MCIBT...' debate topics. Send in your entries, folks!

H F-W

■ Coupé plea

I'm an 18-year-old Irish student and I have ordered a SAM Coupé from England - and am eagerly awaiting its arrival. If any other Irish Coupé owners exist (the machine is not on sale over here) would they like to write to me?

Shane Smith, 120 The Quay, Waterford, Eire

It's a pleasure Shane. Maybe they'll stop writing to me... only joking!

H F-W

■ Pushed to the limit

I still reckon that one of the most amazing games I ever saw - if not the most amazing game - was New Generation's *3D Monster Maze.* What it managed to squeeze out of the ZX81's utterly crap graphics has to be seen to be believed. Has any computer since been pushed this close to its limits?

Robert Baker, London

Probably not.

H F-W

■ Christmas appeal

The season of goodwill is now almost upon us. I would like to think the computing community is also doing its bit. So I would like to appeal to all the people out there who are upgrading their computers, or who have computing equipment gathering dust in the back of cupboards, to do something useful with their cast-offs.

Hospitals, childrens homes, and a variety of charities that could use that piece of cupboard decoration so much better than you.

J E Godfrey, Bristol

I'll start the ball rolling with a fiver to Children In Need.

H F-W

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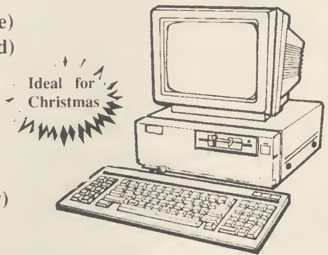

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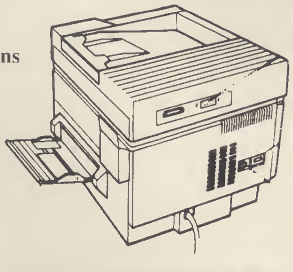

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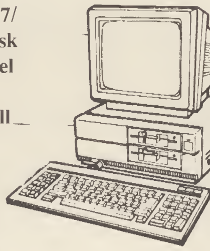

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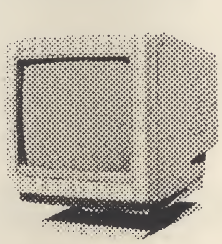

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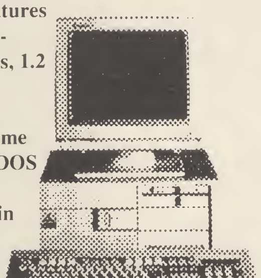

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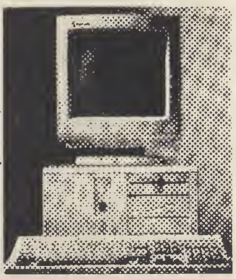

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COMPUTER CRIME!

What is it, who does it and why? Al Baron talks to author Buck Bloombecker about a book which explodes the myths and exposes the true cost.

Could you begin by describing *Spectacular Computer Crimes* for us?
My book summarises the work at the National Centre for Computer Crime Data in a way that illustrates how computer crime has become a problem affecting all of us. The standard view of computer crime is that hackers are the only criminals and the victims are all big corporations who can afford the loss. But that point of view is an invitation to bad security.

A company which only worries about hackers isn't going to worry about malicious or even ignorant people who spread viruses who don't happen to be hackers. There are many employees, ex-employees, even conference delegates who are involved in computer crimes that cost half a billion in the US and £1 million a year here in the U.K.

It's not a lot though, really is it?
I don't know how to relate to numbers that big. A reporter once said that the cost of traffic tickets in the United States was probably much greater than the cost of computer crime.

But the seriousness of computer crime is certainly enough to justify legislative attention, and for a computer user to say: "I'm losing money here and could justify spending some money on computer security,"

For an individual PC user, if you haven't worried about computer viruses yet then it's none too soon to start – particularly if you're using bulletin boards or if you're getting hold of a lot of software.

Wouldn't you like to see standards adopted?
Most American computer crime laws already say if you damage a computer system or any part of it, it's a crime.

With intent?
Yes, with knowledge. If you know what you're doing and you do damage to the system – that is enough. You can *say* that you didn't want to cause anyone any harm. Robert Morrison didn't want to cause anyone any harm and said: "Well it's too bad 6,000 computers were interfered with by my program." But there's a difference between saying, "I didn't know I had a virus" and "I had no idea what my program would do". The first is easy to believe but the second is a more questionable area.

What did he get?
Fined $10,000 and with 200 hours community service.

That's not a lot either is it?
No, we have to fight against the implication that you won't be seriously punished if you're convicted of a computer crime.

Tell us about some of the crimes in your book.
The first chapter is about a man called Schneider: Jerry Neal Schneider, who ripped off his local telecommunications company in the San Fransisco area when a kid in 1971 and who is now an international banker. I use Schneider to demonstrate some of the myths of computer crime and to contrast that with reality. The myth is that Schneider went from a computer criminal to a computer security consultant, and the presumption is that he is fabulously wealthy as a result. In reality he never made a dime as a computer security consultant.

In the course of my research I found that Schneider claimed he'd worked for IBM, Honeywell, and AT&T. I called one of the consultants who had asked Schneider if he had been a consultant for all these people and he had replied "yes, by all means". But when asked if they'd paid him Schneider had said "no"! My colleague felt he'd used the term "consultant" rather loosely.

What motivates a computer criminal, greed?
There are several types. The 'Sandbox' type is someone who just likes to play with computers – your typical hacker, in it because it's fun. But there are people who are in what I call the "land of opportunity". They will say "the trust fund was just sitting there!" A lot of employees commit computer crimes not because of the challenge but because of the lack of challenge.

Then we have the 'Battle Zone'. In my book there's an example of a fella who destroyed over 100,000 records. He was annoyed with his company because they wouldn't let him engage in a tax protest. The global version of this is the 'Soap Box' instead of the 'Battle Zone', someone who commits a computer crime to make a political statement. One example is a woman who destroyed a computer she believed was going to be used for first strike attacks on the Soviet Union.

•*Buck Bloombecker : fighting computer crime with information.*

How did she destroy it?
Physically! She took a crowbar and whacked away at it.

I'm surprised that is classed as a computer crime!
I admit that not everyone does, but my point is what *is* computer crime? We can define anything we want as long as we have a reason for doing it, and I think the need to define computer crime is to protect computer systems. We are investing more and more time and money in computer systems, from individual PCs to enormous interconnected networks.

If we had a lot of people going after computers because they want to destroy them for political reasons then that is important data for security professionals.

Who's the worst computer criminal in your opinion?
I take a certain perverse pleasure in saying that of all the criminals I have analysed none of them were sufficiently evil in motivation or devastating in their effect to really qualify. I think the ones caught so far have been typical human beings, motivated by greed or malice.

Oliver North, is he a computer criminal?
Well, I say his computer crime was trying to steal history. He didn't succeed but I certainly worry about a Government official using computers in an attempt to cover up his misdoings. Particularly when it is part of this preposterous theory of deniability: where a President thinks he has the right to set things up so that when his crimes are discovered he can pretend that he didn't do them. Of all the people in my book he is the one I'm most annoyed with.

What about computer crime myths. 'The salami technique' for instance where the criminal tops up all the half cents on the payroll and then has them made out to his pay cheque at the end of the month. That was actually used in a Richard Pryor Film.
There may have been a few cases, but like the alligators in the New York sewyers it is kind of a myth.

What other myths are there?
I like to go after the myth that the victim is a large, rich computer corporation which can afford the loss many times over. Another one is that all computer criminals are computer experts. I point out how someone who knew nothing about computers set up a two level fraud system.

At the first level he stole money from 1,600 computer users by saying: "Let me rent your spare computer time and pay you per hour while you use my software/hardware to make automated phone calls to people". That was a simple scheme because he just didn't pay people and collected all their deposits of $525. The devious part was the purpose for which these people were using their computers – to make calls advertising a trivia contest that was totally bogus, there was no contest, no first prize, no trip to Atlanta, nothing. With 1,600 people using their computers to make hundreds of calls, we are talking tens even hundreds of thousands of people, victimised at least to the extent of having to listen to this fraudulent scam, and in many cases being taken in and sending in money.

These people were as sophisticated as your readers, yet they fell for it. Partly because the guy had 'Cow Lists' – lists of people who had been victimised or milked before and who he felt could be victimised again.

Consumers of computer goods and services have got a raw deal because the consumer protection movement hasn't the energy to take care of them and the industry has not matured enough to set up much in the way of consumer protection. Stories of lack of customer support are legendary: calling the support number for three days and not getting a call back or getting unreadable documentation.

I spoke to a member of the City of London Police who said computer crime is virtually non-existent and hackers are regarded simply as a pest. Is it a myth about hackers breaking into banks?

75 per cent of computer crimes in the States involve a theft in which the computer plays a significant role, and even more cases involve theft of communication services as well. The other 25 per cent of computer crime in the US involves hackers of one form or another, so to say that hacking is not extensive is certainly inaccurate.

Computer crime is like an environmental issue. Crimes committed now are indications of weaknesses in our security systems, in the way computers are produced, or in the provision of computer services. If we heed the warnings we can develop effective strategies before the situation gets out of control.

Computers aren't going to destroy the environment, but what could they destroy? Freedom?

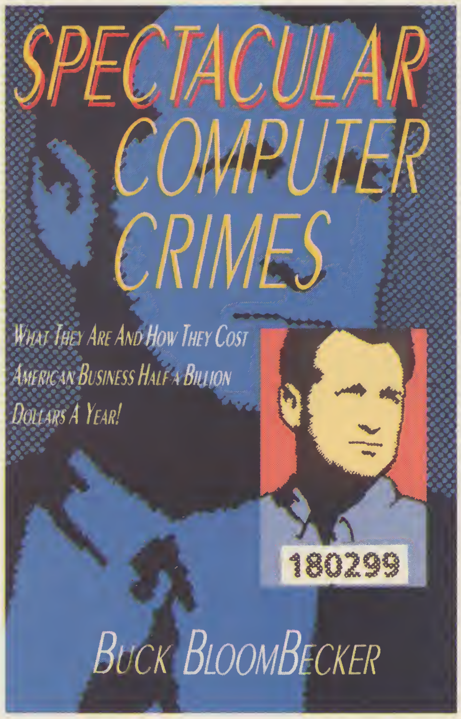
Look at the systems that rely on computers – nuclear reactors, network control systems, traffic systems, hospital life support systems – inadequate security in areas like these can be the key to a really dramatic disaster. One of the greatest computer-politics triumphs of recent times was the block we put on Star Wars in the United States. The argument that dampened the enthusiasm for Star Wars was the poor technological feasibility of the system. An enthusiastic President putting up an untested system which could have increased the likelyhood of nuclear war... it would have been a disaster.

We have this myth that computers are a totally positive, totally harmless technology. As if none of the by-products of capitalist industrialism that have affected other environmental issues are going to arise from the increased use of computers. I think that's foolish. Without proper attention to safety, anything that has that much impact on our society must be watched carefully.

But you posed the other side of the question, whether computers threaten our freedom.

I was thinking specifically of databases. Can we deal with the Big Brother aspect and the flow of information? What are your views on companies selling mailing lists and personal data on people?

I think the concept is worrying. Having interacted with a number of government agencies and having had first hand experience of the US Freedom of Information Act (and knowing how little help that is to the individual), I feel insecure. I am troubled by the knowledge that I don't know what government agencies may know about me, may share about me and what consequences for my professional career that data may have. Anyone who thinks about the problems of information and the use to which it is put has to share those fears.


SPECTACULAR COMPUTER CRIMES
WHAT THEY ARE AND HOW THEY COST AMERICAN BUSINESS HALF A BILLION DOLLARS A YEAR!
180299
BUCK BLOOMBECKER

I am comforted by the inefficiencies of the American Government in terms of making use of all this information. If the people who are pledged to defend our liberty are no more technologically sophisticated than Richard Nixon or Oliver North, who thought he could erase documents by pressing the delete button, our privacy is safe because they're too stupid to invade it.

There are a lot of people as dumb as those two and the big business of the future will be picking out the garbage. The computer revolution has increased the volume of garbage to the point where that may be our best defence. It's the way I protect my office; there are 35 boxes of filing that need to be done on top of the filing cabinet. It would take so long for anybody to find anything of value they would just look at it and say: "Lets find somebody who is organised, he'd be a much better target."

However, I've just read about hospitals getting certain services in return for making patients' databases available to data processing agencies, so that the agencies could send letters to everyone who was pregnant, or who had just turned 18, or whatever. I think that this is abominable.

Do we need laws to protect us from Government?

I'm not sure the law would be an effective way round that problem. We passed the Privacy Act in 1974. I researched the extent to which Americans believed their privacy is protected more from computers now than it used to be, and the number of people saying "no our privacy is less protected" is increasing.

Are they right, is their privacy less protected?

I think more correct information is being collected all the time although I'm not sure how much of it is being used.

My prejudice as a lawyer is that action against the Government for violation of privacy might serve us better than either regulatory schemes, like the Data Protection Act here, or the Privacy Act in the US. The US act doesn't seem to work even when enforced by two fisted regulators.

Let's talk about viruses. Virus vandals – do people create viruses and hold governments to ransom?

I haven't come across any instances yet. In fact one of the things that puzzles me is how so much development has gone into viruses without anyone figuring out how to gain from them. I guess the closest we've come was that guy who was sending thousands of AIDS information disks around and supposedly following up with virus threats and demands for money. Apparently he turned out to be deranged and his disks were not dangerous.

Could even talking about this give people ideas?

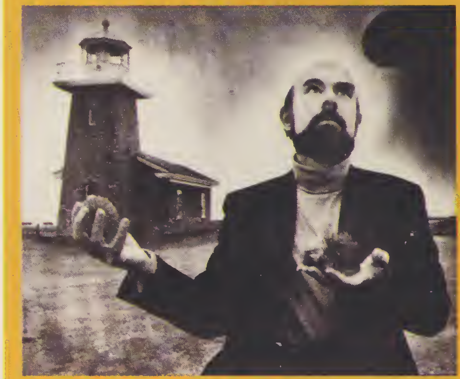
I don't worry too much about putting ideas into people's heads, I worry more about not putting balancing ideas in other peoples heads. Most genuinely concerned people would be inclined to side with me. Incidentally, I'm very curious about the withdrawal of *The Hackers Handbook.*

I don't understand the reason for withdrawing it, or for threatening prosecution if it wasn't withdrawn. It would be hard for me to imagine that happening in the United States. If they did they'd have to take all the books on fraud investigation off the shelves and you can't teach how to investigate fraud without describing fraud. If the only difference between my book and *The Hackers Handbook* is tone then I'm nervous – because tone is in the eye of the beholder.

I used to use a speech called 'Computer Crime – the Career of the Future', but people came away saying "You seem to be encouraging computer crime". So without changing the context my next speech was called 'Why I'm not a Computer Criminal'. I made fun of Stan Rifkin, he converted $10.2 million into diamonds and then didn't know what to do with them! By the time he was arrested he told the police "I've been practising for you to question me". This is not the glamorous, computer criminal image the media sometimes portrays.■

● *Buck Bloombecker's* Spectacular Computer Crimes, *is available from Charles Letts and Co Ltd, Diary House, Borough Road, London SE1 1DW. Price £18.95*

THE BUCK THAT NEVER STOPS



Buck is the 45 year-old Director of the National Centre for Computer Crime Data which is a Californian non-profit activist research institute ten years in existence. He's an attorney by training and has been running this corporation for the last three years

Buck conducted his interview replete with a bag containing two rubber chickens. When asked to explain this rather odd accessory he replied;

"One of the goals in my professional career is to mix performance art with computer security, so I have a presentation called "Juggling for Greater Computer Security Awareness" and I juggle with chickens, and scarves, and fish balls and other symbolic juggling props and it tends to make the topic of computer security more immediately visible." Obvious really eh?

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Macintosh

USER GROUPS

This week, I thought I'd take a look at a few user groups for the Mac.

We start with (wait for it) the Macintosh User Group UK. Unlike any of the other UK groups, this one actually has paid employees, and is run as a business (albeit a non-profit making one). It was formed about four years ago, and offers a very professional-looking magazine, a bulletin board and a telephone help line, as well as local group meetings. The staff are extremely knowledgeable about the Mac, and the chances are that they will have the answer to any question that you throw at them. If not, then they are likely to know someone who can help.

The magazine, called *The Mac Times UK*, is filled with news, tips and reviews, as well as articles of general Mac relevance. Membership of the group also entitles you to full access to MacBaud, the bulletin board, which has a large library of public domain software to download, as well as the usual BBS electronic mail, news and help sections.

Individual membership costs £25 per year. Write to the group at Macintosh House, 11 South Parade, Oxford OX2 7JL, or phone them on 0865 58027.

Next on the list is Apple 2000, a ten-year-old group which is billed as 'the all Apple user group committed to all Apple users including Macintosh'. In fact, the group seems to cater for the Mac more than for the Apple II, so don't be put off by thinking that great chunks of the magazine won't be relevant to Macintosh owners.

The magazine is published every two months, with a short newsletter on the other months. The content of the magazine seems to be slightly more 'hardware teccy' than that of *The Mac Times*, and is compiled from articles sent in by members – which means that the quality varies a little, depending on how good is each individual author's style. However, there's a lot of interesting stuff there, again ranging from technical details to reviews of software, hardware and books.

Membership, which also gives you full access to the group's bulletin board, TABBS, costs £25, and if you're interested you should write to Apple 2000 at PO Box 3, Liverpool L21 8PY.

As well as these national groups, there are also local collections of Mac fanatics about. One I've heard of is the London Macintosh Users Group, which meets on the second Tuesday of every month. Meetings are open to non-members – everyone pays £1 on the door. Members receive the group's magazine, called *The Finder*, and have access to a large public domain software library – all programs are copied free, which could be a considerable saving over using a commercial PD library. The group has also negotiated discounts for members with some Apple dealers.

Membership costs £8, and should be made payable to London Macintosh User Group and sent to Dave Oakham, 29 Swallowfield, Munster Square, London NW1 3JP. Yes, really, it is called Munster Square! Alternatively, just turn up to one of their meetings: the next two, which will be held at the Institute of Child Health, 30 Guildford Street, London WC1, are on December 11 and January 7 starting at 6.30pm.

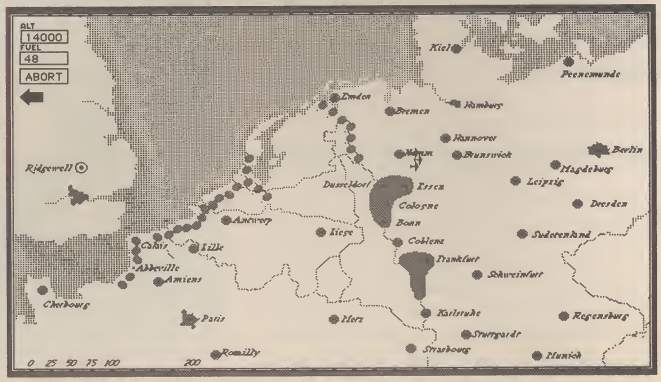
If you run or are a member of a Mac user group, and you want it publicised in *Express*, drop me a line c/o the magazine and I'll give you a mention.

GAME TIME

I recently received a review copy of a game called *Bomber* from KimTec. It is a *HyperCard* stack which is supposed to simulate flying an American World War II bomber on 25 missions to blast the hell out of various European locations.

The game runs in black and white (owners of colour monitors have to reset to two colours before the stack will work) and will not run under *HyperCard 2* – so all you Classic, LC and IIsi owners have had it, I'm afraid.

Essentially, the game involves sitting watching a rather uninspired screen display for much of the time, then watching another screen display while your plane flies through flak (which you can do nothing about). Enemy fighters attack every so often, and when this happens you try to get one of your gunners to hit them, although this just involves clicking the mouse button – there's no skill involved. When you near the target, you have to refer to a small booklet with some very dodgy 'maps', try to work out just where you're supposed to be aiming your bombs, then hit the bomb release button. Having missed completely, it's back



• **Bomber 2:** *If you want to sit staring at a screen like this for long periods, this is the game for you.*

home (and back through the flak, fighters etc.).

OK, so it doesn't sound as though I was enamoured with this program. Well, that's not strictly true. In fact, it's mildly addictive for a while; but after five or six missions, sitting for three minutes watching a small picture of a plane moving slowly across a map of Europe begins to lose its appeal. Also, I'm not sure that a program in which the main aim is to blow up French cities is particularly good for entente cordiale (although on the other hand...).

If this sort of thing sounds like your tasse de thé, then contact KimTec UK on 0202 888873. It costs £49. Also, while you're talking to the company, request a copy of its latest catalogue. It's quite good, and contains details of a large number of programs that I haven't seen advertised elsewhere (including some that look rather more appealing than *Bomber*).

POSTCARD FROM AMERICA

It's Morgenstern time again, folks...

"It wasn't a very good weekend for the infamous Chuck Farnham. He broke both his arms. Chuck is a self-described 'information junkie.' He's Apple's resident corporate spy, a computer security consultant, and soft-core software king. He also spends time using computers to help develop mentally disabled children. He's a real-life character out of a twenty-first century pot-boiler.

"Chuck made his fame diving into trash cans outside of Apple's corporate headquarters. He regularly found confidential reports, and diagrams mixed in with the empty yogurt containers and coffee grounds. The details were then passed to the fact-starved Macintosh press. He discovered software prototypes, and early developmental programs in dead hard disk drives in Valley flea markets. After a while people just started sending him things.

"Chuck developed the first commercial stack, the Smutstack, which was released two weeks before HyperCard went public at a MacWorld Expo. He's embarrassed how much money a silly collection of sounds, cartoons, and scans of naked women brought in. His later version, the Carnal Knowledge Navigator, was also a hit.

"Chuck was leaned on by the F.B.I. during the nuPrometheus investigation – the theft and distribution of the Macintosh ROM code. For once, he claimed he didn't know what was going on!

"His latest information gathering expedition centres on the Kennedy assassinations. He's producing the first CD-ROM product for conspiracy enthusiasts. Who wouldn't want colour TIFF files of Lee Harvey Oswald's autopsy? J.F.K.'s X-Rays? Or thousands of pages of police reports digitized and processed through the latest optical character reading software? It's going to be a collectors edition of 100 copies. He promises that the promotional Christmas card will be 'in profoundly bad taste.'

"When I heard about Chuck's arms, I wondered if he'd finally pushed someone a little too far. Nothing so glamorous – he tripped over a low slung chain fence in a used car lot."

Ian Wrigley

PC

COMPATIBILITY PROBLEMS?

It's looking as if users may experience one or two problems running existing CPC software on the new Plus machines.

For example, three Loriciel games – *Harricana*, *Bumpy* and *Mobileman* – to pass through our hands during the last couple of weeks fail to work on the office's new 6128 Plus even though they work fine on all our other CPCs. And Goldmark's excellent *Nirvana* disk management utility is another casualty of the upgrade.

The reasons why some software doesn't work aren't clear yet, but from a few conversations we've had with software houses, it seems unlikely that there will be similar problems with new software. Indeed, even existing titles which don't work may well get upgraded by the publishers if they're still selling in sufficient quantities.

The fact that there are any problems at all is a bit of a shame, as Amstrad maintained that great efforts were made to ensure total compatibility.

In the meantime, CPC owners upgrading to a Plus may find that one or two of their old favourites don't work. Hopefully these programs will prove to be in the minority. Certainly, the vast bulk of CPC software we have at the office certainly works with the new machines.

MULTIFACE MAYHEM

While we're on the subject of incompatibility, Romantic Robot has run into trouble with the Multiface II. It seems this version doesn't work properly with the Plus machines, which is surprising since it was sent to Amstrad for approval.

The problem is apparently a minor one, and Romantic Robot is expecting to have it rectified by now. Any Plus owners who have bought a Multiface II already can get hold of a new version by returning their old one, and only the modified version will be sent in future.

If you want to get in touch with Romantic Robot, the address is 54 Deanscroft Avenue, London NW9 8EN. Or you can call 081-200 8870.

CODERS COMPILATION

That CodeMasters outfit, apart from boasting about the biggest turnover of any UK software house (a claim which apparently is true) also happens to produce some pretty decent software. Not only that, the company has also invented a new type of release – a budget compilation.

Basically, the principle is the same as for full-price compilations. Collect together a few releases that have been selling as individual products for a few months and whack them into a single package at a single game's price.

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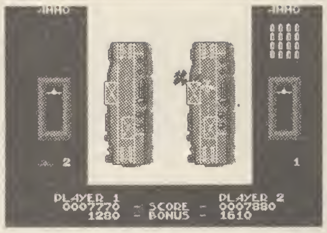
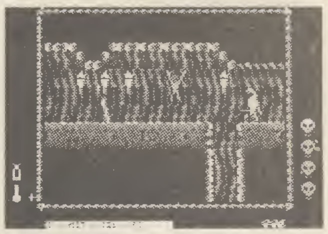
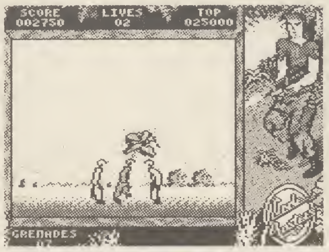


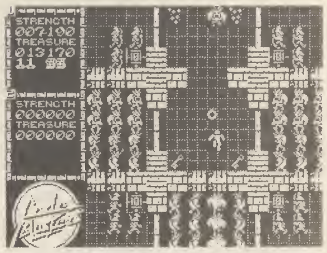
• *Are you ready for the outbreak of World War III? If you play Arcade Flight Sim, you'd better be...*



• *Death Stalker's a couple of years old now, but there's still no denying it's a very good hack 'n' slash romp.*



• *SAS Combat – subtle as a housebrick between the eyes.*



• *Ninja Massacre gives you 50 giant screens of frantic one or two-player action.*

• *Tasters of the four games available on Codemasters budget compilation* Combat Quattro.

When you do that with budget games, of course, the result is incredible value for money. Which perfectly describes the Coders' latest offering – *Quattro Combat.*

Combat gathers together four past budget releases, all rather loosely based on a general 'combat' theme (99 per cent of computer games involve combat...) and presenting the buyer with a bewildering variety of joystick-bashing anarchy.

For a start, there's *Arcade Flight Simulator*, which won't win any prizes for realism but is a perfectly playable, if basic, airborne dogfighting game. You have to take to the air, knock out ten enemy planes, pick up a bomb and drop it on the enemy base in three different levels, each corresponding to a major historical conflict.

First there are World War I planes, then you embark on World War II, and then... OK, so World War III hasn't happened yet, but you can guess. Best of all, though, is the two-player mode, where the game changes into a simple one-on-one dogfight. Simple-minded it may be, but it's also great fun.

Death Stalker is rather different. Here you embark on a sword-and-sorcery, prisoner-rescuing, monster-hacking romp both above and below ground. You'll need to look out for keys, potions and food in a game that combines puzzles, exploration and arcade action. *Death Stalker*'s been out for a couple of years now, and there's nothing about it that's likely to set the world alight – but for a budget release, it still looks very good.

Which unfortunately can't be said of *SAS Combat*, certainly the weakest of the bunch. The graphics are colourful enough, but crude and blocky, and the gameplay changes from rather easy to frustratingly difficult as you move from one section to the next. Nevertheless, if you like lobbing grenades, shooting, stabbing and slashing fellow human beings, *SAS Combat* should provide many hours of harmless fun.

Finally, there's *Ninja Massacre*, which is thankfully rather more subtle than the title suggests. Not entirely unlike *Gauntlet* (to say the least), in some ways it's much better. You can play it as a one or two-player game, for a start, and in two-player mode the players can either co-operate or work in competition. (Warning – this can lead to much bad language and ruined friendships!)

Each level in the game is several times the size of the screen display, and contains an assortment of nasties, rooms, passageways, collectable items, puzzles and – of course – an inordinate amount of ninja-style hacking. The most amazing thing of all, though, is that there are fifty different levels! This game is huge. The characters are small, but well drawn, and your little ninjas whack along at a hell of a rate when they move (a few full-price software houses could take note here). All in all, an excellent offering, for one and two players alike.

All four games (well, maybe three of the four) were extremely good value when they first came out, but now that you can buy all four for a measly £2.99. This is an offer simply too good to miss.

RASTAN POKE

This popular budget blast gets infinite lives, thanks to Andy Price of Dunstable. As ever, those dots indicate those otherwise hard-to-see spaces:

```
1.'.RASTAN.Hit.Squad
2.'.by.Andy.Price
3.'.More.lives.than
4.'.you.can.use
5.'.M2.poke:&D77,lives
6.'
10.DATA.21,16,BD,36,C3
20.DATA.23,36,0E,23,36
30.DATA.BE,CD,36,99,21
40.DATA.17,BE,22,46,A5
50.DATA.C3,08,A5,DD,21
60.DATA.B1,A7,11,00,01
70.DATA.CD,40,A7,21,2A
80.DATA.BE,22,5A,A8,C3
90.DATA.DB,A7,3E,FF,32
100.DATA.1D,2C,C3,22,48
110.MEMORY.&8FFF:LOAD"!
120.FOR.a=&BE00.TO.&BE31
130.READ.b$:b=VAL("&"+b$)
140.POKE.a,b:c=c+b:NEXT
150.IF.c<>5101.THEN.180.
160.INPUT"No..Lives";cm
170.POKE.&BE2B,cm:CALL.&BE00
180.PRINT"DATA.error"
```

Rod Lawton

Amiga

PC POWER PLUS

The boundaries of PC emulation on the Amiga have been pushed back still further with the recent announcement from SDL that an even more powerful version of its ATonce PC emulator is being developed.

Some would argue that 80286-based ATonce is already powerful enough for its own good, but German developer Vortex is hard at work on a version of ATonce based on the even more powerful Intel 80386 processor. As if this weren't already enough to impress us, it's even intending to build in the extra hardware necessary to use both EGA and VGA displays. Stonking or what!

No firm price or release date as yet, but SDL hopes to have the thing available for early next year. Expect to see a full review at that time.

CARTRIDGE CAPERS

The Software Business thinks it may finally have the answer to the problem of software piracy on the Amiga – games on cartridge.

According to a source close to the company, it is rumoured to be working on a new system which will allow it to sell major software titles on cartridge format for little more than the price of current games – about £30 seems to be the target price.

The cartridges, which will work on both the A500 and A1000, will plug into the machine's expansion slot, giving both instant access for the end user and protection against illegal copying for the software house. Not only that, but the cartridges should prove considerably more reliable than conventional floppy disks, therefore removing the need for so-called 'back-up' devices.

In the meantime I understand that games released on cartridge format will also be made available on floppy disk (for A2000 users etc), but product releases could eventually be restricted to cartridge if the new format proves successful, which I believe it will. Our source also revealed that the Software Business is planning on making the technology available to any software house which wants it, therefore establishing a cartridge standard across the Amiga games industry. Sounds like a good idea to me.

MUSIC FOR THE MASSES

Amiga musicians starved of a good read may be interested in a new disk magazine launched to provide coverage of the musical aspects of the Amiga. *Music Matrix* contains a wealth of musical software, hardware and book reviews, music programming tips, tutorials etc, plus a generous helping of music-related utilities and programs. For synth owners, there's usually also a selection of sounds for use on keyboards such as the Roland D-series and Yamaha FB01.

After looking through their first three issues, I must say that I am impressed. There's a healthy educational slant on many of the articles, making it ideal for both experienced musicians and beginners alike. According to *Music Matrix*'s own Lou Nisbet (a music teacher himself), the aim of *Music Matrix* is to get people to co-operate in the writing of music software, especially educational music software. As a result, Lou would no doubt be particularly interested to hear from you if you're a programmer writing music applications on the Amiga.

If you're lucky enough to own the superb M1 synthesiser from Korg, then *Music Matrix* can also supply an Amiga disk containing 500 original voices for this wondrous piece of kit. I dumped the sounds into an M1 and was pleasantly surprised by their quality. Lou is also hard at work on a similar pack for the Kawaii K1, which should be available soon. Best of all, both packs costs just £30, so there's no excuse for Korg and Kawaii users not splashing out.

Each issue of the *Music Matrix* costs £10 and is available from Lou who is on the other end of 0592 714887.

AMOS UPDATED (AGAIN)

New from the AMOS PD Library is yet another update (well, it's an extension actually) for Mandarin's acclaimed games creation language, AMOS. This new extension allows AMOS direct control over the serial port hardware of the Amiga, making it ideal for such applications as multi-user games (linked through a null modem cable) and perhaps even MIDI applications. For more information, give Sandra Skarkey (yes Sandra, I spelt your name correctly this time!) a call on 0942 495261.

The extension provides no less than fifteen new commands such as SERIAL OPEN (opens the serial port), SERIAL SEND (send a strings to the serial port), SERIAL INPUT$ (reads a string), SERIAL SPEED (changes the baud rate) and SERIAL FAST (turns on the 'Fast' bit in the serial device, therefore allowing high speed transfers such as MIDI).

Sandra would also like me to inform you of the fact that the AMOS PD Library has just released its catalogue which contains some quite brilliant AMOS games and utilities. Thanks to Sandra, I've been able to play quite a few of the games that people have sent in and I must admit that I'm impressed. Not only are they stunning examples of what some Amiga users are capable, but they're a real tribute to the power of AMOS.

If you haven't bought your copy of Mandarin's AMOS yet, then rush out any buy it now. As I said within my review of this fantastic piece of software, AMOS is quite simply *the* BASIC programming language for the Amiga – no other BASIC gives you so much for so little. Mandarin are on 0625 878888.

YET ANOTHER ABACUS BOOK

On the subject of all things musical, Abacus has launched yet another book to add to its already immense range of technical books for the Amiga. Will these people never stop? There surely

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cannot be a single Amiga-related subject about which Abacus hasn't written a book (if there is, I certainly can't think of it!).

Anyway, the exciting new release is none other than *Making Music With The Amiga* which, as the name suggests, is all about music on the Amiga, of both the MIDI and sound chip variety. The book takes you through all aspects of music development. Whether you're learning the fundamentals of music notation, the elements of sound synthesis or special circuitry to interface your Amiga to external musical instruments (synths etc), then this book is for you. The book explores the many ways of making music on the Amiga. Don't have a sound sampler? Then why not build one using the complete schematics and step-by-step building instructions supplied within the book. For MIDI buffs, there's even a complete DIY project to build your own MIDI interface, therefore saving you pounds on pre-assembled interfaces available elsewhere.

Topics covered include the basics of sound generation, music programming in Amiga BASIC, sound hardware programming in GFA BASIC, the music-specific IFF forms (8SVX and SMUS), MIDI fundamentals, sound sampling and even an in depth look at several major music packages (*Aegis Sonix*, *AudioMaster II*, *Deluxe Music*, *Dynamic Drums* etc).

Making Music On the Amiga is available for £29.95 from Adamsoft who are on 0706 524304. The price may seem rather high, but this also includes a diskette packed with the source code examples printed within the book. All in all, Abacus' latest is a book that I recommend wholeheartedly.

Jason Holborn

Archimedes

THE BEST OF '90

Oh jolly dee, it's *that* time of the year again. The time for presents, parties and pandemonium, Christmas? No! It's my birthday on the 13th! So I'd thought I'd compile a list of games I'd like. Of course, if you don't want to buy any of them for me, I'd still recommend them as suitable prezzies for any Archie owner.

So what has 1990 provided for us button freaks? Well, mainly golf games but with a smattering of shoot-'em-ups, a couple of adventures and a small assortment of others. The 4th Dimension has proved itself to be the only real dedicated Archimedes games producer, although Minerva is still releasing games and Crysalis slowly but surely is producing some very good ST/Amiga conversions.

I've already extolled the virtues of *MicroDrive*, the really rather good golf simulator from CIS in *Express* 104. Needless to say I still think it's the best golf program on the Archie. The forthcoming course designer will be interesting to see, and should keep the game's popularity going.

Superior Software's *Golf* comes complete with a designer and although its front end is nicer than *MicroDrive*'s, the game play is not much improved over *Holed Out* – once you play *MicroDrive*, you won't want to play anything else!

SOCCER IT TO 'EM

Of the soccer games available, Crysalis' *Manchester United* is by far the best, with 4th Dimension's *Arcade Soccer* coming in second. *Manchester United* has a customised extra-bit screen mode giving the impression of actually watching a football game from the commentary box. Good game play and an extensive management section go to make this *the* football game. *Arcade Soccer* doesn't really come up to same standards. But it's a fiver cheaper and still great fun to play.

All of the Magnetic Scrolls adventures are now available for the Archimedes (except *Wonderland*, but that shouldn't be long now). I can't recommend these highly enough. The textual descriptions are colourful enough even without the accompanying stunning illustrations. If you want a serious adventure go for *The Pawn* or the surprisingly difficult *Corruption*. For the more warped of us, there's *Guild of Thieves*, *Fish!* and my personal favourite, *Jinxter*. All heavily loaded with dry humour and a large side order of wit.

If you want to make up your own adventures, but can't be bothered with all that programming then check out *ALPS* from Alpine Software. This is a WIMP-based adventure creator that should cater for your needs.

On to arcade adventures (or 'Ladder and Platform' games) and you don't really need to look any further than Crysalis' *Mad Professor Mariati*. Another Amiga conversion, but a good one. As with all Crysalis' games, a very slick production with excellent music, cute graphics and addictive game play. From the Minerva camp, there's *Talisman*, an above average explore the castle, avoid the monsters and solve the puzzles type game.

GETTING ZAPPED

For the alien zappers amongst us, The 4th Dimension gave us *Apocalypse* and *Nevryon*. *Apocalypse* is very reminiscent of *Stargliders I* and *II* on other machines. The 3D graphics are plain and often rather gaudily coloured but they are plotted dead quick and shooting them to bits is great fun. Sound is simple but effective and well worth sticking through your hi-fi for maximum effect. All in all a good, fast-moving game for those with a twitchy trigger finger.

Much the same can be said about the sideways scrolling, *Nevryon*, which I covered in *Express* 98. Great graphics, great sound, just a few too many disk accesses and other pauses and maybe a tad frustrating after a while. Overall rather nice though.

I never got to see Minerva's *RedShift* 'in the flesh', so I can't really comment on it. Perhaps I'll get given it on the 13th.

Don't forget Arcana's *Rotor* – the thinking man's kill everything game and watch out for 4th Dimension's *DropShip* along very much the same lines.

For *Breakout* fans, there have been two versions both adding new dimensions to the original game. CIS's *Fireball II* features multi-balls, laser bats, poisoned bricks, brill music and a screen designer. On the other hand is Sisteme's *Ballarena* complete with a two-player mode, lots of bonuses, challenges and most importantly a circular playing area. This is a little difficult to get used to at first, but the multitude of pretty levels make the effort well worth it.

AND THE REST

What does that leave? Well, from Superior, the rather disappointing *Hostages*. Nice graphics but very little else. The infamous duo, *Interdictor II* from Clares (great simulation, plain graphics, not much game play) and *Chocks Away* from 4th Dimension (Excellent game play, o.k. graphics, not too hot on the simulation). *The Wimp Game*, also from 4th Dimension, sounds very interesting, but I have yet to see a copy. Finally, there's Empire's *Pipemania*, the pipe puzzle game as seen on every other computer imaginable. It certainly kept me occupied for quite a while and is well worth a look if you like that sort of thing.

I'd hate to have to put these games in order for a top ten (I think I'd have to include all of them anyway!), but of all of them, the ones I played most over the last year were: *Apocalypse*, *Chocks Away*, *Mad Professor*, *Jinxter*, *Pipemania*, *Fireball II*, *Microdrive* and *Rotor*. If I had to pick a favourite I think I'd have to plump for *NetHack*, the amazingly fun PD Dungeons & Dragons, character-based adventure. Pure genius.

WHAT EVER HAPPENED TO...

Karma? *Hard Drivin*'? *3D Pool*? Well, *Karma* may still emerge blinking into the light. *Hard Drivin'* was never started and Orlando's excellent *3D Pool* was never finished. Seems he got too bored with the idea after coding all the other versions. Methinks I'll have to persuade him to start it up again.

IBERIAN PINBALL

Before I go, I've just got time to mention *ArcPinball*, a rather snazzy game all the way from Shibumi Software in Portugal.

An overscanned screen mode is used to produce a super-big playing area. Some very silly, but amusing, digitised animations are displayed on a miniature Philips monitor in the corner of the screen to show what's going on. There are digitised backdrops, a rather fun front end, a natty little hourglass with real sand grains and a dead funky backing tune. 25 quid? Hmmm, it's worth it. And you don't need to write to Portugal to get a copy. You can order one on 0392 437756.

They also sent me a couple of demos of *The Fat Controller* (a train game) and *Siege* (rescue the princess) which should be out in December. Both were very early demos, but looked very interesting just the same.

Ken Coumarin

PC

GOLDEN OLDIE

A rather different kind of simulator is taking the US by storm. Called *Dino Wars*, it is a dinosaur simulator. You control dinosaurs who roam over the cretaceous plains, fight each other and try not to become extinct. The battles themselves feature huge animations in 265-colour VGA as the dinosaurs rip each other to shreds.

The game, from DigiTek Software in Florida, also claims an educational element; it includes an encyclopedia of facts about the ancient reptiles.

WORK AND PLAY

The latest game from US film spin-off firm Lucasfilm Games is a factory simulator. Doesn't sound too interesting does it? But *Night Shift* is not as straightforward as it seems at first.

For a start the factory in question is Industrial Might and Logic (bad joke boys) and it produces dolls of characters from Lucasfilm games: Luke Skywalker, Indiana Jones, Darth Vader, C3PO, R2D2 and Zak McKracken (or as Lucasfilm puts it, Luke Skywalker™, etc). You have to assemble the raw materials and put together the dolls, while being assailed by lawyers, small furry creatures and foremen bearing quotas.

The game is presented as a platform adventure and promises to be pretty lively. Look out for it out soon.

PIPING HOT

It isn't only anti-social poseurs and Unix that sport pipes. MS-DOS, which is modelled in part on Unix, has them too. (As an aside, MS-DOS should have had forward slashes to separate directory and file names when hierarchic directories were introduced but Microsoft had already blown forward slashes as switch separators after program names). Pipes can make mincemeat of complicated problems.

What they do is take the output from one program and feed it straight into another program. Most folk have seen this in action in the famous line:

```
DIR | SORT | MORE
```

which takes a directory listing, sorts it and then puts it out to the screen a page at a time. Very nice. But did you know SORT can work on any column of a line and even do a reverse sort? If you change the command to:

```
DIR | SORT /+14 | MORE
```

you get a directory listed by file size with all the directories first. Quite useful really. Unfortunately the /R option to reverse a sort only works on the first column.

Piping is a special case of file redirection. Using the > and < symbols you can force output from a utility or

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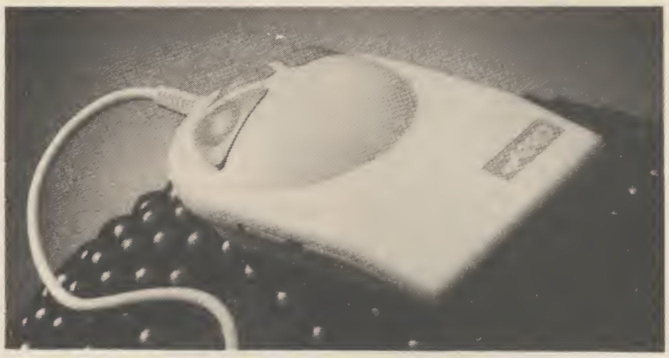


• *Aero Mouse: the first in a whole new generation of mice?*

command to go somewhere else – usually to a file but occasionally straight to oblivion. This effect is useful in batch files where it enables you to lose screen clutter. For example, a batch file designed to make it easy to move files from one directory to another – the batch file MOVIT.BAT takes two parameters on the command line and looks like this:

```
ECHO OFF
COPY %1 %2 > NUL
DEL %1 > NUL
ECHO %1 MOVED TO %2
```

Now the messages produced by COPY and DEL disappear into the void.

IBM MAKES LIFE EASY SHOCK

Big Blue has got together with the US firm Metaphor to form Patriot Partners, a company which aims to make producing portable programs a lot easier. It is working on a system which will allow developers to use the same source code for programs running under OS/2 and Unix. There was some talk of extending it to the Macintosh too. Ordinary MS-DOSers get left out, but with the convergence of Windows and OS/2 Presentation Manager, that state of affairs won't last long. Don't get too excited though, as the system won't be out until '92.

WEIRD MOUSE

Mice are mice are mice. They all look much the same really, except for the new Aero Mouse from ICA Technology.

Inside it's a perfectly ordinary Microsoft / Mouse Systems serial mouse, but the buttons are a bit different, as you can see from the photo. There's not a lot more to say about it, except that its made in Taiwan, will be pretty cheap when it gets here (it's selling for $15 in the States), and can be got direct from Taiwan on 886 2 792 8990.

MORE MEMORY

I was talking to a guy from the Australian memory board manufacturer Hypertec the other day. He told me that they can't make enough memory expansion boards these days to fulfil the demand, and the reason is simple: Windows 3.

Since Microsoft's program broke the 640K memory barrier – in some cases at least – there has been a real point in having megabytes of memory on an MS-DOS PC. Previously you were limited to using extended memory for a disk cache or RAM disk, or switching to expanded memory which only certain programs could use, and then only inefficiently. Windows 3 not only uses its memory to the full, it actually requires at least 2Mb to really work properly.

With extra memory Windows can run several MS-DOS programs at the same time, and specially written Windows programs can use as much memory as you have (and if you have a 386, you can use even more!). And the extra really does make the difference. I changed machines from a 16MHz 386 with 1Mb to a 12MHz 286 with 2.5Mb. Guess which one ran faster? No prizes, but you're right.

If you feel like adding some more RAM, Hypertec does a range of boards. Call them on 0672 63936.

Stuart Anderton and Steve Patient

64

CARTRIDGE CRISIS

There's probably going to be a bit of a to-do, as my old gran would say, over Domark's latest C64 release, *Cyberball*.

Cyberball, you see, is their first cartridge release. It's also crap. Why this is going to create that to-do I mentioned is because cartridge games, in case you didn't know, cost a small fortune to make and duplicate. How such a game fares will be closely monitored by the company that makes it before it commits itself to producing more titles on the same format. Here's why Domark should consider closely exactly how *Cyberball* performs in the marketplace.

As the name implies, it's a futuristic sports sim in which robots take the place of human players in a game not altogether unlike american football. The player takes control of one such team and either tries to get an explosive ball into the other team's end zone or attempts to stop the other team from leaving the device in his end zone.

Different defensive and offensive plays can be selected from screens displayed between plays before the action takes place on a portion of the field (seen in vertically scrolling overhead perspective).

Statistics and score data occupy the top portion of the screen and sprites looking akin to armoured cars dance around the whole display as the game unfolds.

The game only incorporates two special features of note but both are sensible enough. The first is a two player option. Interestingly, when this is selected players do not take opposing sides, rather, they co-operate to defeat the other team (most of the players on both teams are computer controlled for the duration).

Secondly, when a players choose which teams they want to control, they can choose from one of the amateur league teams: this being *Cyberball*'s nod in the direction of different difficulty levels.

UNTRUSTWORTHY TEAM-MATES

The problems with *Cyberball* are evident throughout. Computer controlled adversaries, for a start, have often been the downfall of games that depend on them, the rub being that they are usually all too easy to outwit.

Here, however, the problem lies with computer controlled players on your own team. Not only are they markedly inept to start with but but they also haven't got a clue which side they're on. Ridiculous as it may seem, many of your team-mates will do their utmost to bring to an abrupt end any drive you make against the other side. I"m sure they'd try to tackle themselves if they had the wit to think of it.

More sinister still are the unseen blockers from hell who liven up the game at every opportunity. When you're making a clear break through the scrap yard that is the opposition's line of defence, invisible adversaries frequently throw spanners into your robots' works, bringing an excellent tactic to a tacky end.

Truth be told, though, excellent tactics are indiscernible from bad ones as none of the plays you can make ever seem to influence the outcome of a play one way or the other. But should you consider these problems to be nothing more than minor niggles, consider this: the game also has a habit (albeit an occasional one only) of locking out altogether. Yes folks, it's bugged.

CYBERCLAIRVOYANCE

Now the chances are that this game is going to be slagged off in every review it receives because these faults are glaring and unforgivable. If these hammerings from the gaming press translate into poor sales, Domark might not consider another cartridge release on the grounds that they're too expensive to risk a flop. If it considers why it flops, on the other hand, it will be better placed – and better motivated – to produce a damn good cartridge game next time.

All this is assuming the game flops, of course. A game's unmitigated crapiness does not, by and large, preclude its chances of success. Of course. *Cyberball* stands every chance of being a bit of a stormer simply because it may well be one of the few readily available cartridge games encountered by all those Christmas console buyers oblivious of what the machine is really capable.

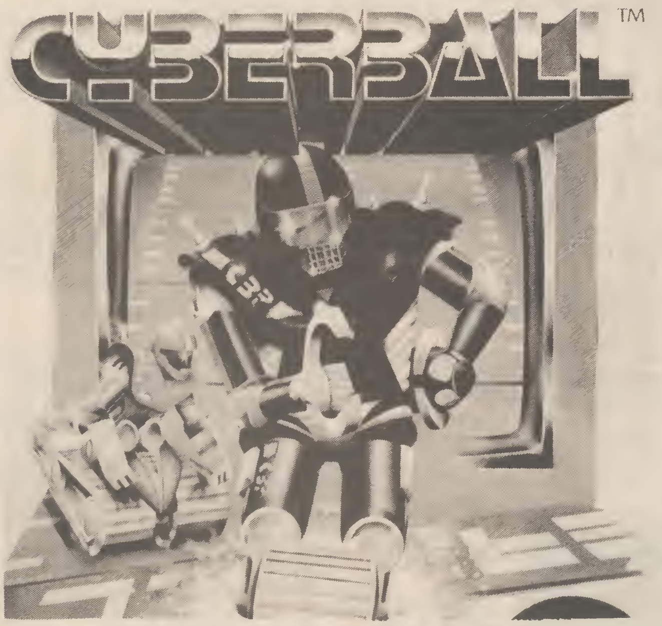
This isn't so much a case of caveat emptor as Under No Circumstances Should This Game Be Consumed. And when February comes around and you sigh with relief at the knowledge of at least one turkey avoided, you can keep a look out for Domark's next effort with a little optimism.

CURRYING DISFAVOUR

According to *Express* reader surveys, a whole one per cent of the magazine's readership possesses a C64/128. My recent gaff may therefore have gone largely un-noticed but I feel obliged to correct it.

In *Express* 107 I referred to an ex-chairman of Acorn as Tim Curry. Alas, Tim Curry is the actor who played the transvestite mad scientist, Dr Frankenfurter in the cult film *The Rocky Horror Picture Show* and has never been punched in the face by Sir Clive Sinclair. Chris Curry, on the other hand, has been punched by Sir Clive but has never dressed up in women's clothing. The similarity between them is entirely co-incidental and I unreservedly apologise for any confusion I may have caused.

Sean Masterson



• One of those daft robots that tackle you magnificently, even though they're supposed to beon your side.

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CHRISTMAS CHEER FOR SAM OWNERS

Coupé owners could feel a bit left out this Christmas. Whereas everyone else will awake on the 25th to find a stack of software for their machine, there's still precious little for Santa to drop in a SAMster's stocking, whether they've been good all year or not.

But I reckon there are two items about which Coupé owners should fax details to Father Christmas without delay – the *Total Recall* and *Robocop* public domain film demos. These are two excellent disks for the Coupé that feature digitized stills from the original movie and cost a paltry £1.50 each. And as they are public domain you can copy and swap them with friends.

Get hold of them from the clever author Guy Middleton at 35 Victoria Mount, Horsforth, Leeds LS18 4PU.

Guy should have another two of his disks out by now. The first is a Yuletide jobbie called *Christmas Quiz* which is a trivia game with graphics and a cash prize of a tenner. The closing date for entries is December 21 so you'll need to be quick if you want to play for money rather than just fun.

The other is a film demo this time based on *Star Wars*. Sounds good. Both cost £1.50 from the same address.

MUSICAL BUG

Oh no. Apparently there's a bug in Garry Rowlands thoroughly sound music creation utility *Music Writer*. But don't worry as it's not too serious, and free updated versions are available to existing users. If that isn't enough Garry has sent in some Multiface pokes that sort everything out. So if you have *Music Writer* and drive B is not being recognized even though an icon appears when it's connected, try the following:

When at the "READY TO FORMAT" use Multiface to enter

```
E326 = 16 42 18 13
E33B = 16 4D 3A 79 5B BA CA 34 A3
7A CD FD 99
E351 = 4F 00
```

This should be done with page 0 paged in. It can also be done once *Music Writer* is in use, but then the POKEs should be made with page one paged in.

By the way, if you saw a favourable review of *Music Writer* in an organ called *Micro Mart* a while back that was credited to Garry Rowland, dispel all suspicious thoughts. Garry assures me it was a mistake and, yes, I did check to see if his fingers were crossed.

PILES OF POKES

Here are some pokes which don't give you infinite amounts of anything for a change. They're all of a slightly more technical disposition and were kindly sent to me along with loads of other tips by Robert J. Baker of London.

To delete entire program without disturbing chosen colours:

```
POKE 23627, PEEK 23635: POKE
23628, PEEK 23636: CLEAR
```

To delete from line n to end, leaving start untouched:

```
RESTORE n: RANDOMIZE (PEEK
23639+256*PEEK 23640+1): POKE
23627, PEEK 23670: POKE 23628,
PEEK 23636: CLEAR
```

To disable break and make most (though not all, especially not error C) errors trappable:

```
PEEK 23610, RANDOMIZE (PEEK
23613+256*PEEK 23614-2): POKE
23613, PEEK 23670: POKE 23614,
PEEK 23614, PEEK 23671.
```

To restore normal error-handling, of course, do the above again with +2 instead of –2. (23613/4 contains the address to which the machine stack pointer is reset when an error occurs; normally this points to the address of the main part of the error handler, but the above forces it to point to the address of the "return from handling a ästatement" routine.)

To force a system reset if BREAK is attempted (or any other error occurs):

```
POKE 23613,4: POKE 23614,61
```

To divert stuff destined for the screen to the printer (for debugging purposes, for example):

```
OPEN #2,"p";
```

Likewise, to divert stuff from printer to screen:

```
OPEN #3,"s"
```

To cancel either use the opposite OPEN #, or use CLOSE #.

To see a spectacular technicolour crash:

```
RANDOMIZE USR 3616.
```

The exact effect depends on current values of 23624 and 23693 and possibly 23694/5/6/7 as well.

Hope I've conveyed them mistake free. Cheers Robert.

TURTLE CHEAT...PERHAPS

You seen the film, worn the slippers, eaten sandwiches out of the lunch box and puked up the pizza. Now I'm proud to present the cheat for the *Teenage Mutant Ninja Turtles* game. But hold fire with the Cowabungas, there's a slight catch.

Trusty old regular and officially adopted friend of the Spectrum column, M Harris of Faversham, Kent sent it in but as even internationally famous journos like myself haven't seen the final *Turtles* game yet M's cheat has only been found to work on a demo version given away with a Spectrum mag that, frankly, is very poor in comparison to our own beloved *YS*. So although there's a good chance it'll work with the finished version don't come running to me if you remain sadly uninvincible after doing the following:

Press CAPS SHIFT 1 0 6 down together. Remember where you read it first! (Unless of course, it doesn't work with the completed shop bought version in which case please promptly forget.) Thanks again to good old M whatever the outcome!

Robin Alway

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ST

CONDOR'S BIG DEAL

If your ST needs a really whacking great Christmas present, what do you buy it? Two obvious suggestions: a hard drive and a PC contemptible emulator.

The second enables anyone who works on PC to bring stuff home and run it on an ST. The first is probably the best thing you could ever give your ST at Christmas. No longer will you have to scrabble about behind your ST looking for a floppy to save files on. No more searching high and low for your boot disk, or that word processor. Simply bung the lot on your hard drive and away you go.

So what better time to consider Condor Computer's special bundle offering both *Supercharger 1.4*, the expandable plug-in MS-DOS PC emulator and a whacking great 40MB Series 900 hard disk drive (rated by *ST Format* at 92per cent)? The price: £549, a saving of £50 on the full list price of the two items separately.

Contact Condor Computers on 0734 810066 and ask for Christmas Package Offer information.

THIS WEEK'S QUIZ

How much do you reckon it costs to exhibit at the All Formats Computer Fair, a one day box-shifting show at the New Horticultural Hall, Westminster? Answer at the end of this week's column.

FULL CIRCLE GO FOR IT TOO

But wait! Before you shell out for the Condor deal, consider carefully the bundle offered by Full Circle.

For just £20 more than the Condor offer you get ATonce, the £200 PC emulator, bundled with the excellent Vortex DataJet 40Mb hard drive – at £569. That's a.whole tenner less than you'd expect to pay for just the drive alone!

Oh blimey. That's really put the cat among the proverbials. Which deal is better? Well, there's little doubt that the Vortex hard drive (ST FORMAT rated 94per cent) is the sexiest thing to come in a box since Madonna and that incident with the tea-chest.

The PC emulator business is more complicated, and your own requirements will play a large part in your decision. I suggest you check out both deals – Full Circle is on 0622 677173. One thing is certain: you can't lose.

ANALYST BREAKS OUT

One of the things at which humans aren't terribly good – this in particular – and at which computers are brilliant, is number-crunching. So it makes excellent sense for Walsoft to release *The Analyst*, a shares, commodities, currencies and economic statistics analysis program.

I'm told – for I don't pretend to understand a word of what is being said – that *The Analyst* incorporates some of the most advanced analysis techniques such as oscillators, detrenders, seasonal analysis, cycle finders, gann angles, bull and bear charts and much, much more in a similar incomprehensible vein. Also included is a full data history on the *Financial Times Shares Index 100*, which I think I might just about understand.

I guess that my complete inability to know what the hell any of this is about is one of the reasons why I shall never be rich enough to give to get sent to prison for insider dealing. Ah well.

If you sincerely want to be rich contact Walsoft, 226 Darnall Rd, Sheffield S9 5AN and mention the Help Get Steve Carey Out of Poverty Fund.

PROTEXT SURVIVES

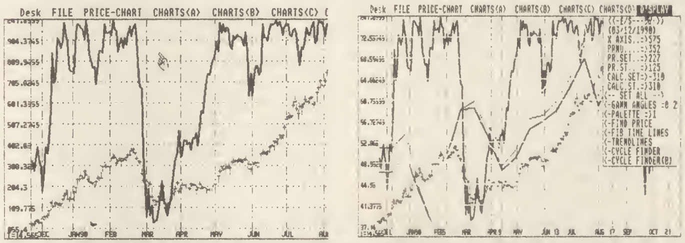
Within the past couple of months Arnor released its long and eagerly awaited GEM-based version of *Protext*, the highly regarded ST word processor.

However, at £149.95 it's rather difficult for many users to justify the expense. It's undoubtedly a superb program, and especially inviting to any ST owner who's graduated to 16-bit from Amstrad CPC, where the program began life.

So what do you do if you think £150 is too steep? Up till now, nothing. But now version 4.3 has been released, in effect a GEMmed up *Protext* without the extras that make version 5 so expensive.

It has the new pull-down menu system, dialogue boxes, improved mouse support (including block-dragging) and file selector, but what it doesn't have is a £150 price tag. Admittedly, £99.95 is still a lot of money to pay if you're only ever going to write the odd letter begging for an extension to your overdraft, but for anyone who needs a professional standard word processor, *Protext 4.3* is a strong option.

Arnor can be contacted on 0733 68909.



• Screens from The Analyst, which is apparently a "shares, commodities, currencies and economics statistics analysis program," whatever that is.

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MORSE TUTORIAL

I must confess to almost complete ignorance of morse code. Does anyone use it anymore in this computerised age, and if so, what for? (Stands back and awaits torrent of abusive mail from exasperated readers astonished at my appaling stupidity.)

Right, now that's out of the way, I'd just like to tell you that my old friend George Butler from Ramsgate has put together a two-disk morse tutorial for the ST. It costs £14.95 including morsekey cable, postage and packing. And I know George has put months of work into this project, because he's been keeping me up to date with it.

Orders or more information (include SAE please) from Lucid Publications, 18 Hobart Rd, Ramsgate, Kent. Best of luck, George.

HOORAY FOR HOORAY

One of the surprise chart appearances of 1990 has been Database Software's *Fun School 3*, the most successful educational program ever.

Emboldened by the success of the *Fun School* series, Scetlander has at last released an ST version of *Hooray for Henrietta*, a highly regarded fun maths package for five year olds upwards.

Hooray aims to help kids add, subtract, multiply and divide, with each maths skill having eight levels to ensure the ideal starting point. Naturally this somewhat solemn element is enlivened by a whacky storyline featuring the eponymous Henrietta, Hopeless Harry and John the Parrot.

Colourful animation and fun for all are promised, and the program is designed to fit in with the National Curriculum.

Hooray for Henrietta, which costs £24.99, is available in the shops or direct from the publisher, Scetlander, which is on 041 357 1659.

PUBLIC SECTOR REVIVAL

To my certain knowledge there are not far off 50 Public Domain Libraries operating in the ST market, ranging from tiny one-person-and-an-ST type outfits right up to the excellent and highly professional likes of Goodman PDL, Floppyshop, the ST Club and South West Software.

Somewhere in between, I suspect, is Public Sector, a library that's just approaching its first birthday. As a special Crimbo-type offer, Public Sector is offering two disks for the price of one, provided you order three disks.

At £2 a disk, including post and packing, Public Sector can hardly claim to be the cheapest on the market, and its catalogue is not quite in the Goodman league, but I've never yet heard anyone complaining about the service it offers.

Best disk: *Art 13, Fractals* – not nearly as dull as it sounds. In fact it's probably the best PD fractal drawing program I've seen, plotting the entire Mandelbrot set, chaos set and Julia curves. Even if it is programmed in GFA Basic (compiled of course), it is amazingly fast for what it does.

Cheques payable to DJ Friston at Public Sector PDL, 50 Ripon Rd, Stevenage, Herts SG1 4NA, or call 0438 364722.

WINTER OF DISK CONTENT

Despite taking place in one of the least welcoming venues in London –the New Horticultural Hall, Westminster – the All Formats Computer Fair does at least promise to offer a wide range of heavily discounted ST games, as well as a good sprinkling of Public Domain and shareware libraries. An opportunity, perhaps, to pick up a few bargains. Who knows, you may even come away with a few knockdown Christmas pressies, you bloody cheapskate you.

The next All Formats Fair will take place on Saturday December 15 and doors will be flung open to the general public at 10am.

Incidentally, the answer to this week's quiz is that it costs £75 to exhibit at the All Formats Computer Fair. (This, according to the organisers, is a Good Thing, because it means that many of the 100 plus stands cannot be found at other shows.)

Steve Carey

• The All Formats Computer Fair, a good place to get cheap software and bruised toes.

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We must however stress, that unless you are experienced in graphology, then we can in no way guarantee the accuracy of the information that the program provides. If you are an enthusiastic amateur or just curious, then this program could provide hours of entertainment, whilst teaching you the finer art of this fascinating subject.

The text within THE GRAPHOLOGIST was researched and written by a top London graphologist/criminologist James Woodward. The software was written by Martin Evans our consultant software writer.

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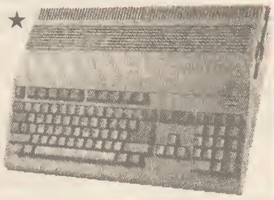

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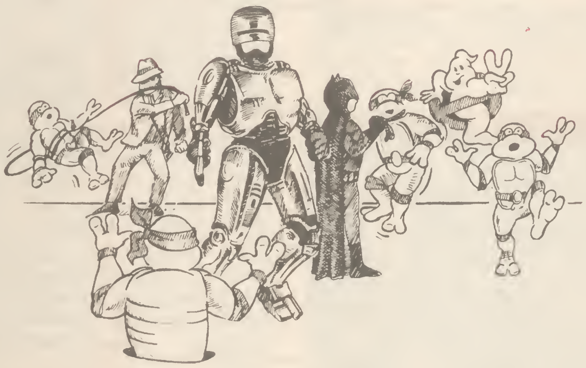

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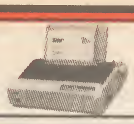

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CDTV DISK DETAILS

Although there has been widespread despondency at Commodore's announcement that the launch of CDTV has been delayed yet again, the software side of Commodore's Amiga CDTV division is still as active as ever.

Commodore's press office in the US has released details of more than 25 multimedia titles under active development for the system. All the disks detailed in the release are, Commodore claims, being readied for an early 1991 release.

The titles cover a wide range of topics, from interactive versions of the *King James Bible* and the *World Vista Atlas*, to entertainment titles such as *Battle Chess* and *Sim City* (See the accompanying table).

"The challenge facing the consumer electronics industry is to provide content, not just advanced technology," said Nolan Bushnell, general manager of Commodore's interactive products division.

According to Bushnell, the success of the CDTV system lies in its interactivity and immediate access. He cites an example: the recipes in the CDTV version of the popular *Silver Palate* cookbook series – to be retailed as *New Basics Electronic Cookbook* by Xiphias – provides the cook with step-by-step instructions, alternative seasonings, realistic images of the meal in progress, and the ability to recalculate portion sizes instantly.

Bushnell added that the first 35 titles represent just the beginning of the development of the CDTV library. Commodore International's software division, as well as other developers, plans to introduce additional titles on a regular basis, including, *Murder Anyone?*, *North Polar Expedition* and the *Family Medical Advisor*.

Bushnell also revealed that several of the world's top applications software developers, such as Lucasfilm, Cinemaware, Virgin Mastertronic and Spectrum Holobyte, have products under active development for CDTV.

In the US, CDTV is expected to retail for less than $1,000 while disk prices should range from $30 to $100.

KRAFT TRACKBALL

Kraft Systems has launched a neat peripheral for the Atari ST – the Tripletrack ST trackball.

Unlike other trackball units for the ST, the $79.95 Tripletrack has been designed specifically for the ST, and, reckons the company, comes with features that you won't find on a typical ST mouse.

Interestingly, the Tripletrack has been modified to work with the old Atari 400 and 800 series of computers as well as the Commodore Amiga and C64/128 series. A small switch on the side of the trackball casing allows the unit to be switched out of `ST mode' and into `other computer' mode.

It has also been designed so that it can be used with equal ease by both right- and left-handed people.

What separates the Tripletrack from other mouse-emulation trackballs is the inclusion of joystick emulation. By switching to position three on the side switch, the Tripletrack operates like a joystick.

Contact: Kraft Systems, 450 West California Avenue, Vista, California 92083, United States. Telephone: 0101-619-724-7146.

MICHTRON US MOVES EAST

Michtron Software's US operation has been purchased by a software group from Newark, Delaware, in the US. The company's new president – Jim Dorsman – has taken control of Michtron's technical support, development and publishing interests.

The break with the old guard of Michtron is not total, however, as Gordon Monnier, the company's former president, is acting as a consultant to Dorsman and his new staff.

Dorsman has already announced plans for an aggressive new range of software to be quickly developed and launched under the Michtron label. The company's existing range of software will continue to be sold and supported from the new offices in Newark.

UK distributors of the company's software should experience no disruptions. The company is now looking for foreign products to supply under its own label in the US, as well as abroad.

The only cloud on the horizon is that the Michtron supported BBS in the US has been withdrawn while the company moves offices but it assures that a new BBS will be up and running shortly.

For more information, or to be included on the revitalised MIchtron mailing list, readers are encouraged to write or call the company at its new address: Michtron Incorporated, 3201 Drummond Plaza, Newark, Delaware 19711, United States. Telephone: 0101-302-454-7946.

ATARI CHEAPIES SURFACE

Word from Canada is that the new Atari Mega STE and laser printers are now beginning to appear in the shops. As a result, there are some great bargains on the Mega ST and old SLM804 laser.

A 2Mb version of the old Mega ST, for example, can now be found for just C$799, while the SLM804 laser printer is going for C$999. The official price in Canada for either unit is C$1,495.

Since it's only a matter of time before the new Atari goodies begin appearing in the UK, it's logical to presume that similar bargain offers will be made by UK stockists of Atari kit. Watch this space.

CHEAP HP CARTRIDGES

While a Hewlett-Packard DeskJet printer is good value for money in itself, many printer users who have upgraded from a dot-matrix unit are often alarmed at the cost of the cartridges.

Now a Maryland-based company in the US has come to the rescue. Raydar's HP ink cartridge rejuvenator kit costs $19.95 for a black ink version, and $22.95 for a red or blue ink version. The company claims that the kit contains everything a user will need for five refills of any DeskJet or DeskJet Plus cartridge.

Contact Raydar products, 270 Winston Road, Andrews AFB, Maryland 20331, United States.

RECORD SALES FOR NINTENDO

Nintendo has announced it expects record sales of its games consoles and hand held Gameboy units for the fifth year running.

Speaking at a toy industry conference in Boston late last month, Peter Main, Nintendo's vice president of marketing, said Nintendo and its licensees expect sales with a combined retail value of over $4,000 million in 1990 – up from approximately $2,700 million last year.

When 1990 ends Nintendo will have sold eight million Nintendo Entertainment Systems (NES) hardware units – 'well over' its original forecast of six million units, said Main.

In addition, Main noted that by the end of the Christmas season Nintendo will have sold 4.5 million units of its Game Boy hardware and 12 to 14 million units of Gameboy software. ■

PRELIMINARY CDTV TITLES FOR FIRST QUARTER 1991

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Gardenfax Houseplants	Intersearch
King James Bible	Animated Pixels
World Vista Atlas	Applied Optical Media
American Heritage Encyclopaedic Dictionary	Xiphias
Family Medical Advisor	Digitas
Time Table of Science & Innovation	Xiphias
Time Table of Business & Politics	Xiphias
Illustrated Works of Shakespeare	Animated Pixels
Japan World	Top Class Tech
COOKING	
New Basics Electronic Cookbook	Xiphias
EDUCATION	
North Polar Expedition	Virgin Mastertronic
Fun School	Mandarin

GAMES	
Battle Chess	Interplay
Defender of the Crown	Cinemaware
Classic Board Games	Merit Software
Many Roads to Murder	Vent
Murder Anyone?	Vent
Excalibur	Virgin Mastertronic
Space Quest III	Sierra-on-Line
Pacmania	Domark
Future Wars	Interplay
Xenon II	Spectrum Holobyte
Sim City	Spectrum Holobyte
Falcon	Spectrum Holobyte
CHILDRENS' STORIES	
Tale of Peter Rabbit	Discis
Scary Poems for Rotten Kids	Discis
A Long Hard Day at the Ranch	Discis
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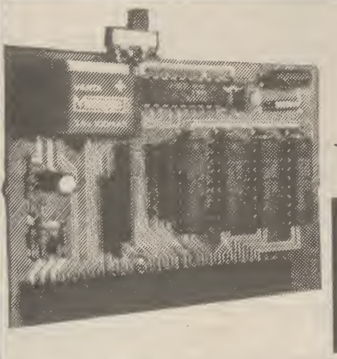

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N.B. Requires Kickstart 1.3 to operate - Kickstart 1.3 Upgrade available from us for £29.95
Please Note: The Upgrade Requires Internal Connection to the Amiga GARY chip.

PHILIPS 15" FST TV/Monitor (MODEL 2530)

With its dedicated monitor input, this model combines the advantages of a high quality medium resolution monitor with the convenience of remote control Teletext TV - at an excellent low price !

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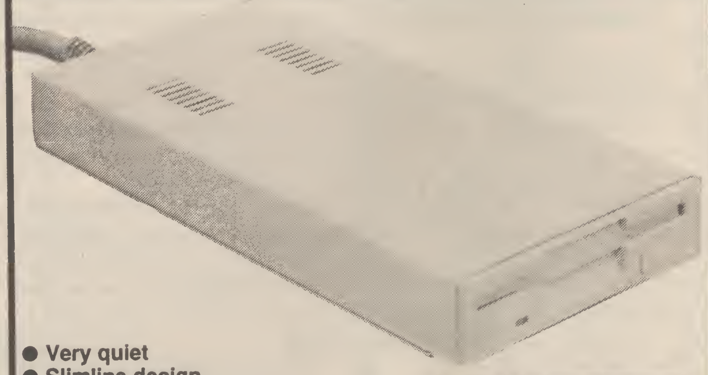

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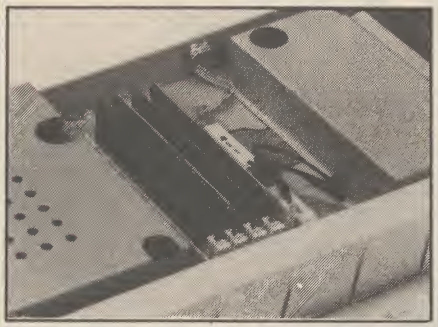

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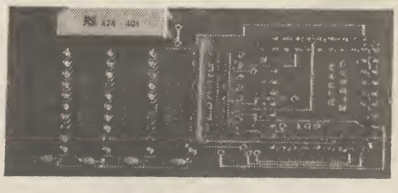

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Iteration, or the use of loops, is the last basic technique used in procedural programming languages. A loop is simply a way of repeating a set of instructions a certain number of times or until a condition is satisfied.

There are many more types of loop than there are selections and the diagram at the bottom of the page shows the main examples. These can be classified by the number of exit points in the loop, their position and the state of the exit condition when the loop terminates.

An enumeration loop, usually written as a FOR..NEXT loop, is used when the number of repetitions needed is known in advance. If you need to read in five values from a user, then the loop will be of the following form:

```
FOR i=1 TO 5
     read value
NEXT i
```

If you do not know in advance how many repetitions will be needed then the exit condition must be tested each time that the computer goes around the loop. This is a conditional loop and the main difference between different types of loops is the number of conditions supplied and where in the loop they are tested. To read in values from the user until a particular value is given, for example, the number of times the commands in the loop have to be repeated is dictated by the user and the loop would have the following form:

```
DO
        INPUT a
LOOP UNTIL a=1
```

Enumeration loops are the simplest way of repeating commands several times, often applied to a set of values. But if your program processes input data either from the user at the keyboard or from a file, then you will need a conditional loop.

A loop is essentially made up of labels, marking the beginning and end of the commands to be repeated, and one or more conditional selections that are used to determine whether control is transferred to the beginning or end of the loop. Originally, these loops would be built up out of GOTOs, in Fortran, and JMP or BRA statements in assembly language, but the commonest variations were formalised in languages such as Pascal, which introduced the WHILE and UNTIL loops, which have the forms:

```
WHILE condition
     BEGIN
     list of commands
     END
```

and:

```
REPEAT
   list of commands
UNTIL condition
```

The important differences between the two are exit position and exit sense and while the constructs themselves are reasonably easy to understand because they implement the two commonest forms of conditional loops, the concepts of exit position and sense are less immediately obvious. Once understood these will make the operation of a loop very clear.

The commands in a WHILE loop are obeyed as long as the loop condition remains true, but the commands in the UNTIL loop are obeyed until the exit condition is satisfied (ie becomes true). This is the exit sense of the two loops; when the program exits from a WHILE loop the condition has become false, but the condition has become true when the program exits from an UNTIL loop.

The exit position is simply the placing of the exit point in the loop – where in the loop the condition is evaluated to see whether the commands contained within the loop will be repeated. The exit point in a WHILE loop is at the beginning and because the condition is tested before the instructions are ever carried out, the commands in a WHILE loop may never be obeyed if the condition is initially false. The exit position from an UNTIL loop is at the end of the loop, so the commands must be obeyed at least once before the condition is ever tested.

In a simple pseudocode, the WHILE loop is:

```
label:  IF NOT condition THEN exit loop
        loop commands
        GOTO label
```

and the UNTIL loop is

```
label:  loop commands
        IF condition THEN exit loop
        GOTO label
```

The differences between the two loops can be confusing because both exit position and sense are changed. More modern languages like QuickBASIC and TurboBASIC allow loops to be constructed as necessary, using the keywords DO and LOOP to bracket the section of code to be repeated. Exit conditions can be placed at the beginning or end or the loop and the exit sense can be specified with the keywords WHILE and UNTIL. These retain the meaning from Pascal, so that a WHILE condition must be false for the loop to terminate and an UNTIL condition must be true. Thus a loop written using the UNTIL condition is equivalent to the WHILE not condition. This allows the Pascal WHILE loop to be written as:

```
DO WHILE condition
loop commands
LOOP
```

but you can also write a loop with the WHILE exit condition, which must be false, at the end of the loop, so that the commands must be carried out at least once. This will have the form:

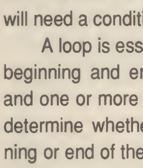
```
DO
loop commands
LOOP WHILE condition
```

Exit conditions can thus be set for true or false. While older languages like Fortran and assembly language allow the loop to be constructed in almost any way you like, more modern languages only allow exit points to be placed at the beginning and end of the loop. There is no reason why an exit point could not be placed within the body of the loop, so that the first list of actions would be carried out once more than the second list:

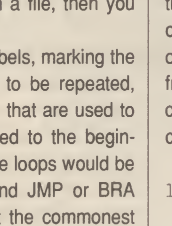
```
DO
 list one
IF condition THEN EXIT LOOP
 list two
LOOP
```

Another facility not usually allowed in modern languages is multiple exit points. Most loops can be reorganised to gather all the exit points, perhaps using a CASE statement, but there are times when you may want to use a construct of the following kind:

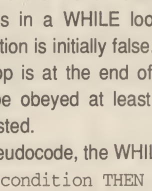
```
DO
 list one
IF condition1 THEN EXIT LOOP
 list two
IF condition2 THEN EXIT LOOP
 list three
LOOP
```



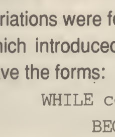
ENUMERATION LOOP FOR I=1 TO 10



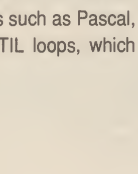
WHILE LOOP; EXIT CONDITION AT BEGINNING OF LOOP



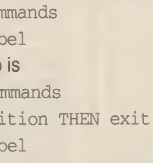
SINGLE EXIT LOOP



INFINITE LOOP



UNTIL LOOP; EXIT CONDITION AT END OF LOOP



MULTIPLE EXIT LOOP

- The iteration of commands in a loop is the basic method of repeating a series of commands several times in succession.
- An enumeration loop is used when you know how many times you will need to carry out the sequence of commands.
- If you don't know how many times the commands will be carried out, use a conditional loop with an exit condition.
- WHILE and UNTIL loops differ in the position where the exit condition is tested and in the value which the condition must have for the loop to terminate – exit position and exit sense.
- Multiple exit loops are not common, but may be needed.

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OPENING TIME

Cross fertilisation. Try that one for a concept. Try it as an action – but only in the garden.

Last week *Express* reported on the Acorn/Apple joint venture. Centrefold spies spent the rest of the week digging around for more of the same, and came up with some astonishing speculations. These are firmly based on many unreturned phone calls and sitting in the Hack and Laser Writer (our local) talking very quickly in between rounds. See what you think of these possibilities...

Amstrad and Olivetti: a truly European team could pool the resources which brought the PC/1 and PC200. We could end up with a PC, such as the PC1/200, so cheap that it would run into negative figures and they would pay us to buy it.

IBM and Nintendo: IBM is already chummy with Sega in an attempt to produce a console PC. What about world domination with a NIBMtendo Mutant Turtle Mainframe?

Epson and Intel: The first micro-printer. With Epson's printing expertise and Intel's ability to make incredibly small things, we could soon have a printer which is also a tie-pin.

Atari and Commodore: These two old enemies (but only in a chummy sense of the word) have absolutely no plans to work together, but if they did we could have an Amiga with the ST's graphics or an ST with the Amiga's sound. Just think of it, a Stamiga or an Amigast... or should that be Amighast?

Inmos and Motorola: Wow! Working on the Intel/Epson deal we could have a chip so powerful, so small, and so widely available that Cray would produce a mainframe which no one could see... but there would be millions of them.

I am sure you will agree that these findings are staggeringly important. And they are merely the tip of the iceberg. What if Acorn and Apple actually merge? The new company (Accle, Aporn?) might grow to such proportions that it could buy out IBM, Nintendo and Sega! Then there would be only Amstrad left. The world would be a different place. Computers for all. Now where did I put that medication?

Think on dear readers. Now get out of this column and don't come back here with your Christmas carolling.

Letter Spray

Want to see your name in print? Then write to Centrefold. This week's replies by Tim Smith.

Letters pages are often found in magazines. They are supposedly the areas where readers get to say what they feel about important issues of the day. While Mailbag with the incomparable Haydn Fitz-Williams (and his crisp fivers) is seen by the powers that be as the true forum of *Express*, Letter Spray offers readers with a less academic interest in computing the chance to air their views. What can be in store this week?

Dear Tim,

Why is BASIC called BASIC when it isn't?
Yours, Mike Monkley, Barnstaple, Devon

Dear Mike,

Why is a vacuum cleaner called a vacuum cleaner when it doesn't? Why is a Ford Capri called a Capri when it comes from Dagenham (or one of the Ford factories)? Why is the ALT 386 called a laptop when it would break Geoff Capes' legs? All these question need answering, but not by me. By the way BASIC stands for Beginner's All-purpose Instruction Code... and don't tell me that you're a beginner, and it's not.

Dear Tim,

I don't know if anyone else has commented on the matter, but I feel that the ugly subject of speed and computing is raising its head yet again. I thought that this kind of thing had died out in the 80s, but no. I site *NCE*'s cover of issue 108 as a prime example of this tediousness.

Who really cares? I own an Amstrad 1640 which clocks in at a reasonable 8Mhz. It does its job and has served me well for ages now. In everyday life does it really matter about FLOPS or MIPS? It doesn't affect the way I get on the bus, or the amount of work I can do, does it? So, who does care about super fast computers anyway?
Yours with no stupidity at all
PJ Freed, Bermondsey, London

Dear PJ

That's the kind of look-ahead attitude which has lead this country to the forefront of computing. Try this idea out... it is interesting that a computer can run at 2 billion FLOPS in the same way as it is interesting that the speed of light is 2.997925x10^8 *miles per second. Both astronomical figures might seem irrelevant to your bus queuing but that's simple short-sightedness. A computer processing data at that speed can help in medical advances, technological advances and much much more.*

Bear up old chum, there's a world out there and a great deal of it is fascinating to behold. By the way, don't call me Tim until we've been formally introduced by at least my Butler Lloyd.

IN DEVELOPMENT

An ongoing series which concentrates on what might be happening in the next 50 years of computing. Centrefold spies are everywhere seeking out new projects. Have you heard of anything staggering which should know about? Well tell us.

This week we bring you the Kircaldy Institute of Applied Microtechnology's 'ARMS IlbwT' project.

CONCEPT

ARMS IlbwT stands for Advanced Rapid Micro Sytems IlbwT. The head of the ARMS team is Dr BWT Man. ARMS machines are being developed as a time management aids for middle managers. Based on 69090 processor technology the underlying theory is that giving an ARMS machine to a middle manager will keep them in their offices phoning each other up and bragging about the wide range of peripherals available for the machine (under separate development in Felixstowe). Hence everyone else's time will be managed more efficiently

MODUS OPERANDI

The system will make use of three ergonically designed keyboards. Each comes equipped with three active keys: the "I'm in a meeting auto-fax", the "Hot, white and two sugars" key, and the "You have my full support key". All other keys are inactive save for the interesting screen images they produce. The first ARMS compatible software planned is an interactive package for these keys. It will include a filled in spreadsheet image, a memo image, a golf simulator, and a post-pre-planning-planning-meeting-pre-planner. ARMS machines will be fitted with 140Mb hard disks, PAL, RGB and NTSC colour monitors and handy little security locks with their very own keys and Jaguar Owner club keyrings.

SYSTEM REQUIREMENTS

User will require a company car, an office with a door which is always open, a 'need to know basis' style of working, experience of raising things up the flagpole to see who salutes, the ability to touch base, and a love of planning meetings. Previous computer experience is not required.

PRICE

Company discounts are available. The initial price point is planned at £2,330.

RELEASE DATE

Peripherals in various shades of matt-black will be made available before the machine itself. Release date for the first ARM machine is 31 March 2022.

THE TOSH FORTY

The Tosh Ten has expanded due to reader response. Some of you bothered to write in and say that you liked lists as they were easy to read, dare I say it, whilst abluting. So here we go with four sets of TEN.

TEN ASTONISHING FACTS ABOUT THE ATARI STFM

1) No one called Roger owns one – at least no one we've ever heard of.
2) There are no plans to ship all STFMs to Uranus
3) The STFM is the most popular computer in Winow-Winow (NSW pop 1)
4) No President of the United States has ever owned an STFM
5) The STFM is a really good computer, honest
6) It is more widely used as a business machine than the F19
7) The word Oxter does not appear anywhere on the STFM
8) Atari has never knowingly denied having anything to do with it
9) Disks used with the STFM cannot be used in Olympic track and field events.
10) It is more expensive, pound for pound than potatoes

TEN MIND-FRYING FACTS ABOUT C

1) C programming is more mentally taxing than Catchphrase (with or without Roy Walker)
2) C programmers are more charismatic than Piltdown Man
3) The lines structstats sf1; /*printxp} #include <stdio.j> mean nothing at all in C.
4) C is one of the best ways known to crash your micro
5) People who recommend C make good used car salespeople
6) C stands for C
7) No member of the England World Cup winning squad of 1966 had ever heard of C when collecting the trophy

TREFOLD

8) C was developed by Dennis Ritchie at Bell Labs in 1972(!)
9) C works awfully well with UNIX
10) No one really understands UNIX either

TEN CRUSHING FACTS ABOUT SPREADSHEETS
1) Spreadsheets attract accountants
2) They are not as useful as they sound for picnics
3) Common names for spreadsheets are *KwickCalc, E-ZeeCalc, DourCalc, Lotus 1-2-3*
4) The word 'exponential' is useful when chatting-up spreadsheet users
5) The phrase Shoot-'em-up isn't
6) The Pyramids would have been easier to budget with one
7) Newton never used one
8) Spreadsheets are not boring
9) It is possible to run a spreadsheet on an Amiga
10) Spreadsheeting is a competitive sport in some parts of Japan

TEN STAGGERING FACTS ABOUT CHAOS THEORY
1) 9 out 10 butterflies who expressed a preference said they liked it
2) It has a great deal to do with topography
3) It is now officially unfashionable to talk about it
4) It is unproven
5) The word Chaos is Greek and is not an acronym
6) If you hold a fern to your ear you can hear Chaos
7) *Chaos* by James Gleick was the best selling book about Chaos Theory ever sold in Smiths
8) Chaos theory is based on the idea that everything is relevant as are some forms of mental illness
9) The lines

```
10 WHILE -1
20 PRINT "Glubber, ballon, cruton"
30 WEND
```

will produce chaos if programmed in BASIC on the DVLC computer
10) Chaos theory is not popular in Beijing.

FROM THE ARCHIVE

A week's a long time in politics, an hour is a long time in football, a minute is a long time talking about relativity, and a year is 365 days in computing. So what was happening this time last year? Read on to find out....

NO FAIR! NO FAIR!

Atari decided to take umbrage at Commodore's claim that 200,000 Amiga's have been sold (it's talking about 500,000 this year). The creators of the ST mentioned the word "paddling" in relation to Commodore's figures, the phrase "grossly exaggerated" was also chucked in.

Marketing communications manager for Commodore, Jennifer Perry, prepared to repel borders with the pithy "Atari obviously hasn't been keeping up with what's happening in the market".

Oh dear, oh dear, such petulance.

BE A BETTER LOVER

That advert hit the stands and Atari manages to get two stories in Archive. The ad in question was for the Portfolio handheld PC and claimed that using one would make you a "better lover" as well as a "nicer person".

I KNOW IT! I KNOW IT! I KNOW IT!

Our Em' was pictured alongside a bus conductor in a attempt to make watching A Question of Sport and playing his, well Audiogenic's, new footy sim Emlyn Hughes' International Soccer more palatable.

CAN'T YOU SEE, THEY'RE TAKING US OVER

A report claimed that computers could take over people's lives. 100 plus computer users contributed to the research for a new book called Computer Addiction by Mary Shotton.

121 "confessed computer junkies" took part. Findings such as the sad "computers are easier to get on with than people" came to light. No evidence of people sniffing CPCs or mainlining Orics was found, however.

SEE YOU IN COURT

Activision got awfully hot under the collar about computer games title Ace and its review of Ghostbusters II. Ace had been known to give games 910 points so Activision, and its solicitors, were a tad peeved to see a rating of 25 given to its lucrative film tie-in. Neither the magazine nor the software house were talking to each other to anyone else about the case though.

STACY PEACH

At long, long last the Stacy laptop from Atari hit town. Two models were available, the Stacy 2 and Stacy 4. Both were impressively spec'd and retailed for under £2,000. And that's quite enough Atari mentions for now.

TETCHY-RIS

Software house Spectrum Holobyte was becoming embroiled in look and feel actions over its rip-roaring Russian runaway roustabout game Tetris. It has already succeeded in putting the skids under Accolade's attempt to release a similar game called Fits and Pieces. Tetris already had a history of causing western capitalists hassle as Nintendo and Atari fought over it the previous year.

DESPATCHES

News from around the world. What's happening and where? The Centrefold has the stringers with the answers. This week: Chipman Poncer, our man in South Africa

"The Blessed Margaret has departed the world stage; and even the Russians have finally admitted to food queues, black markets and desktop publishing on an ST. So it's hardly surprising that South African affairs have dropped out of the headlines in recent weeks.

However, rumours are coming my way that BOSS (the not at all secret police) has just purchased a rather large new mainframe and that it comes with a program called GetYerDoshtoSwitzerlandKwik in ROM.

In fact computers are much sought after and the first shipment of NeXT machines are expected shortly – once they've been painted white.

In return for my Sharpville 22XFV laptop I was offered a hundred weight of biltong and a free visit to some chap called Lorenzo Marks who of course I took to be a programmer. It seems 'bil-tong' comes from the Dutch words for 'buttock' and 'tongue' and means 'sun-dried lean meat'. As a card-carrying vegetarian I had no option but to turn them down. Shame really, Lourenço Marques turns out to be a giant red-light district just over the border in Mozambique...

Never daunted I decided to wander around Jo'Burg; suddenly spotting a familiar name I called in at some offices, discreetly named Bröderbund. Imagine my surprise when I find, not our cuddly software friends, but a bunch of ungracious Afrikaans with tiny moustaches and no cheat modes for *Typhoon Thompson* or *Wings of Fury* at all. Luckily I have a black belt in masonic handshakes and a nasty moment was narrowly avoided.

Since Paul Simon's gallant efforts to publicise local music and musicians, MIDI machines have become most popular. The ST is selling like hotcakes and a local bunch of programmers have already come up with a sampler which can capture only non-rhythmically based tunes such as the Horst Wessel. It's sure to be a hit and a half.

That's it for now, I have to go as the 7pm curfew gun has just been fired. Tonight sees me wined and dined by the MD of BothaSoft who is trying to sell me a new adventure game called Survival of the Most Bloody-Minded. In fact I've been invited for lunch on Sunday as well. Biltong I'm afraid, but I'll put it down to research – and on expenses.

I WISH I'D SAID THAT

People say the stupidest things don't they? Yes they do. In fact it is a nearly proven truism that computers are second to football in causing silliness to issue from the mouth of otherwise clever people. Have you heard or read anything which made you gasp in wonder? Well send 'em in.

"Logically speaking, it's f*d"*** **Positively minded *Express* colleague speaking about a certain hard disk.**

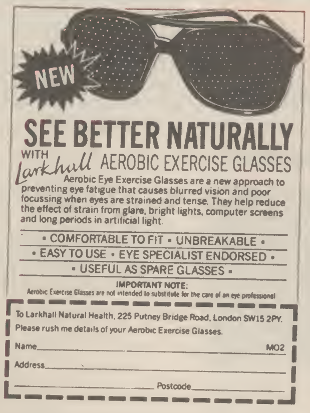
"I've got this great story for you... I can't tell you my name... I can't tell you where I am.... in fact, forget it." **A caller with some hot news speaks to *Express*.**

Do you have any computer related tit-bits, scandals or scare stories? Do you have any tales which you feel should be told? Well get writing to Tale Spin at the address printed above. We'll make it worth your while....

I CAN SEE CLEARLY NOW

Mr JJ Lewis of Shirehampton rushed into the Centrefold office on Monday clutching his sides and this advert from one of the remaining Sunday newspapers.

The text accompanying the acne ridden glasses explains: *"Aerobic Eye Exercise Glasses are a new approach to preventing eye fatigue that causes blurred vision and poor focussing when eyes are strained and tense. They help reduce the effect of strain from glare, bright lights, COMPUTER SCREENS, and long periods in artifical light."* Personally I'd feel daft making my computer wear them. Have you seen any daft advertising with computer interest? Send them in then.



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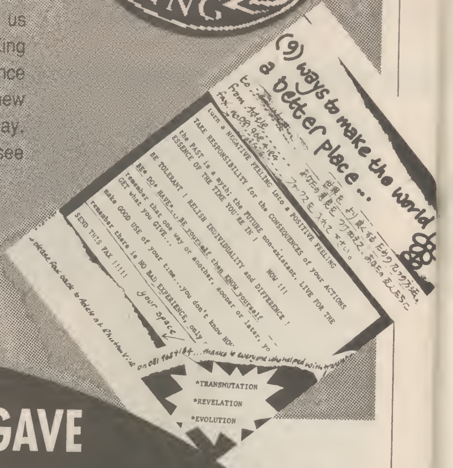
STRANGE BUT TRUE

Along with getting a fax addressed to the NME and informing us of a Bob Marley concert, this week saw us receive a fax from Rhythm King Records. The computer relevance here is that they are working with new software house Renegade by the way. We just thought that you should see the document in question.



(9) ways to make the world a better place...

世界をより良くする為の九つの方法。

to: [illegible]
from: Adele
fax. no. 081 968 4184

あなたの意見をつけ加えて、あなたの友人たちにファックスを入れて下さい。

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BE* DO* HAVE*...BE yourself then KNOW yourself

remember that one way or another, sooner or later, yo[illegible] GET what you GIVE...

make GOOD USE of your time...you don't know HO[illegible]

remember there is NO BAD EXPERIENCE, only [illegible]

SEND THIS FAX !!!!! your space

please fax back to Adele at Rhythm King on 081 968 4184... thanks to everyone who helped with translation

*TRANSMUTATION
*REVELATION
*EVOLUTION

FOOD FOR THOUGHT

Here, in the words of that inestimable gourmond Keith Pomfret, is the "answer to those bloody Turtles". Can you think of any other confections which might work well as software spin offs? If so send them into us at the Food for Thought Comp.

Lusty's Real Turtle Soup
Net Wt. 411 g
Made in England by
John Lusty

MAN CLAIMING THAT HE GAVE SUGAR IDEA FOR PCW DIES

A Centrefold Exclusive

Garry Barrison III Jr from Al Fresco Kansas died suddenly in court this week. Barrison was known as a genius, a chartan, and the only man who actually enjoyed programming in RISC code.

He also made claim to several major computing discoveries such as the Amstrad PCW series, the Apple II, the IBM PC, FORTRAN, and possibly his most outrageous claim; the keyboard. His constant excuse in courts of law all over the world for late filing of claims, in the case of the PCW he filed in January of this year, was that the major hardware, software, IT and publishing companies in the computer world were conspiring against him in a series of convoluted and obscure political machinations. These, he claimed, involved public transport systems, taxi firms and calendar makers.

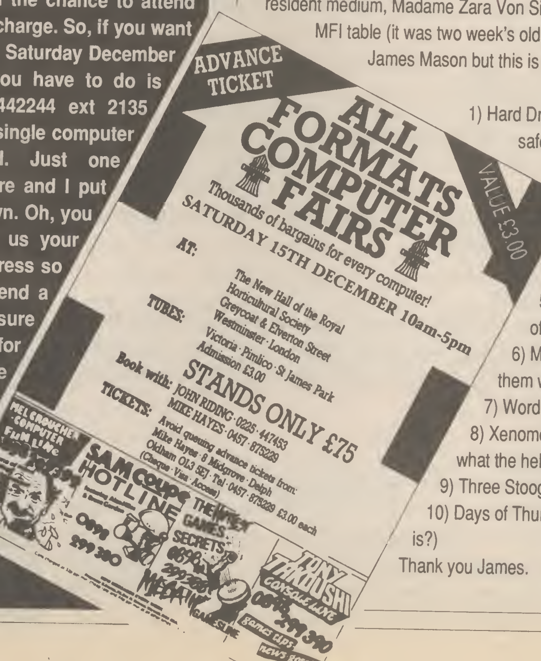
Barrison (44) was known to have spent 28 years involved in legal wrangles. His first appearance was at the age of 16. In 1962 he challenged IBM regarding core memory systems.This only got as far as a traffic court where Barrison was convicted of dangerous driving (he later unsuccessfully sued Ford) on his way to the first of some 233 lawyers. The man is a computing legend, shrouded in myth. He leaves behind him 2,500 pending cases and a cat called Cobol.

Floral tributes are not requested.

SHOWING OFF

Yet again the All Formats Show rolls around. Packed full of all things computeresque; from disk drives for your AT to printer ribbons for your PCW.

The AFS has been getting better and better over the last months and the organisers tell my spies that you can expect even more stalls, more kit and more hotdogs (*do what ? the Guvnor)* . Here at the Centrefold we feel that our dear readers should be given the chance to attend free of charge. So, if you want to be there on Saturday December 15 1990 all you have to do is phone 0225 442244 ext 2135 and say one single computer-related word. Just one mind, any more and I put the phone down. Oh, you do get to tell us your name and address so that we can send a ticket. Make sure to call in time for us to post one of the 30 free tickets to you. I look forward to hearing from y'all.



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MEGAPHONE GAMESLINE
TONY TAKOUSHI CONSOLE LINE 0898 299 390 games tips news gossip

THE CHARTS

This week's Bleeding Charts Club comes from that icon of the 50s, James Dean. Our resident medium, Madame Zara Von Singt gathered the Express crew round an ancient MFI table (it was two week's old) one dark night last week in an attempt to contact James Mason but this is what we got.

1) Hard Drivin' (well, at least when they crash it's reasonably safe)
2) Anarchy (I kind of feel that was my kinda technique)
3) Cadaver (self referential software or what dude)
4) Heroes (what can I say?)
5) Kult (yeah well, it happens to the best of us man)
6) Movie Setter (Ok so I only made three and two of them were crap, but even corpses dream)
7) WordPerfect (Yeah, I was wasn't I)
8) Xenomorph (as a well known intellectual, I'd love to know what the hell that means)
9) Three Stooges (we hang together you dig)
10) Days of Thunder (just who the hell does Tom Cruise think he is?)

Thank you James.

KAO
TDK
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AMSTRAD CPC 6128 manual also needed any blank Amstrad CPC 6128 disks. 0452 720769.

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DONATIONS wanted of computer hardware (working or not) and software. C.I.D (Reg charity) offers to Gordon. Computers and Integrations for the disabled. Garioch Community Education Centre, Inverurie, Aberdeenshire AB5 9QZ.

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64 Geos users wanted for disk based magazine. 119 Deansway Woodloes Park, Warwick CV34 5DQ.

ST Format issues 6 and 7 with disks wanted. £5 paid for each. Tel: 0704 532444.

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ATARI ST user December disk has a virus. Message contained in boot sector "Green Goblin Strikes again!!"

WANTED St contacts 100% reply write to Ally 113 El Der Avenue Greenhills East Killbride Glasgow Scotland G75 8UA.

CPC 6128 I have saved a protected basic program in disk and need to protect it help. Phone 061 797 0179.

HAS anyone out there got a DTP for the C64 for sale. I will pay £20-£25 phone Gary on 0207 580130.

WANTED PPC users - do you want to share your experiences & tips. Contact: Paul 17, Cypress Court, Northampton NN3 3RU.

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STEN-NEWS disk for the Atari ST/STE free send disk for issue 0 or 1 + SAE. Paul Sealy 31 Hartfield Crescent West Wickham Kent.

MANY thanks to ST users - Doggy soft, Tamper and especially Broken Lance. I'm now moving to the Amiga. Gizmo.

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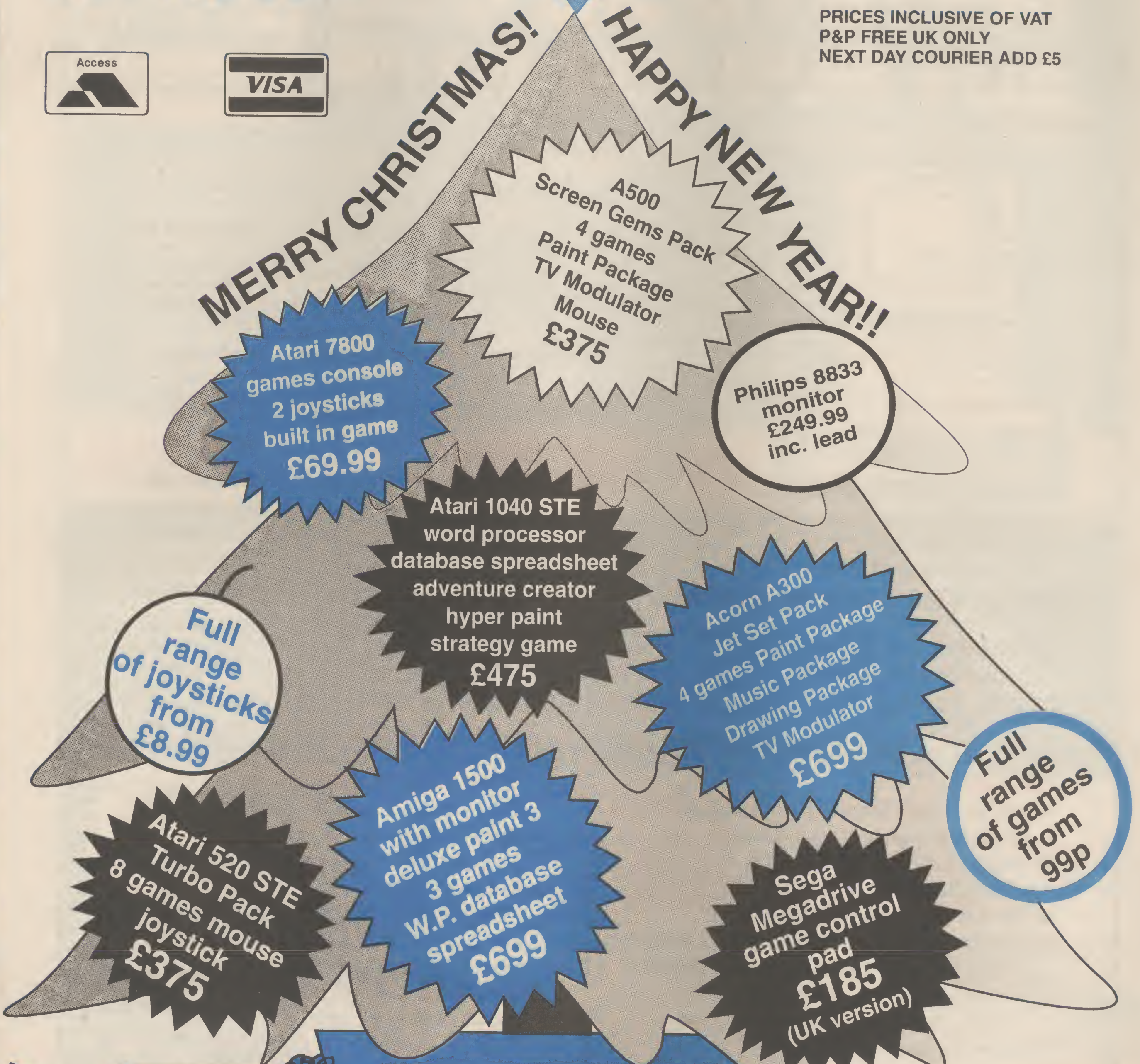

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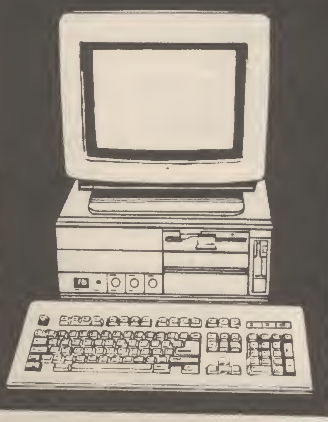

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FLIGHT SIMULATOR (MSDOS) - Alan Hawkins, SIMFLY Club 2 Henley Manor Raincliffe Ave, Scarborough YO12 5BU

FORTH Language - Douglas Neale, FIG (Forth Interest Group) UK, 58 Woodland Way, Morden, Surrey SM4 4DS

FRACTALS/CHAOS THEORY - Andy Lunness, 69 Bronte Avenue, Bury, Lancs BL9 9RN. Telephone061-764 6469

GENEALOGISTS - Computer Group, Society of Genealogists, 14 Charterhouse Buildings, London EC1M 7BA. 071-251 8799

GENERAL HOME MICROS - Steve Winter, Chic Computer Club, PO BOX 121, Gerrards Cross, Bucks SL9 9JP 0753 884473

GUNNING PD ST PD – 47 Auchingane, The Tryst, Edinburgh, EH10 7HX

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HITACHI MBE 16002 PC - Bruce Ainge HICUPS 16 Nine Acres Road, Cuxton, Kent ME2 1EL. 0634 715759

HOUSING ASSOCIATIONS - Caroline Maries, Micro Users Ltd, Beaver Housing society, 23 Lewisham High Street, London SE13 5AF. Telephone 081-318 1126

HEALTH WORKERS - Sue Mckendrick, Healthlink, 164 Windsor Rd, Ashton-in-Makerfield, Wigan WN4 9ES. Voice: 0942 712 385

IBM PC - The IBM PC User Group PO BOX 360 Harrow HA1 4LQ.081-863 1191 BBS 081-863 6646

JUPITER ACE - John Charter, Jupiter Ace Forth User Group, 17 Spring Wood Close, Dunston, Chesterfield S41 8BS. 0246 237555

FIND YOUR LOCAL CLUB - John Dale, Banc y rhosyn, 14 Bron Y Glyn, Bronwydd Arms, Carmarthen SA33 6JB. 0267 230 771

LOCAL AUTHORITIES - Local Authority Micro User Group, John New, Borough Engineer's Dept, Municipal Offices, North Quay, Weymouth, Dorset DT4 8TA. 0305 785101 ext 272

LOTUS PRODUCTS - Lotus User Group, 79-80 Peascod St, Windsor, Berks SL4 1DH. Telephone 0753 841686

LYNX - R B Jones, Lynx User Group, 39 Ashton Close, Needingworth, St Ives, Cambs

LYNX DISK USER GROUP. J Koushappas. 172 Pasteur Gdns, London N18. Tel: 081 807 3859

MEGADRIVE CONSOLE CLUB – consoles: Engine £165, Supergraf X £255, Megadrive £180. All new. Also Megadrive games new, old, bought, sold. Also exchange games. Andrew Stanford (0789) 764039 for more details and free list

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MEMOTECH - Phil Eyres - Memotech Owners Club, 23 Denmead Road, Harefield, Southampton SO2 5GS Telephone 0703 585106

MICROSOFT WORD - Lesley Port, Microsoft Word User Group, Folly House, Madeira Walk, Bachelors Acre, Windsor, Berks SL4 1EU. 0753 831001

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MOTOROLA 68xxx MICROS - Rick Applegate, 68 Microgroup, 8 Great Cob, Springfield, Chelmsford, Essex. BBS 081-316 7402

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NASCOM/80-BUS/CPM - Scorpio Systems, PO BOX 286, Aylesbury, Bucks HP22 6PU. 0296 624868

NEWBRAIN - Ron Bury, NewBrain Support Grp, 70 Cranberry Lane, Darwen, Lancs BB3 2HL 0254 771891

NIMBUG, 13 Belle Vue Ave, Gosforth, Newcastle-upon-Tyne NE3 1AH 091-285 7806

NW ARCHIMEDES USER GROUP. Meets every Friday at Citizens Advice Bureau, next to Spectrum arena in Birchwood, Warrington. Ring Paul on 051-426 3915 after 6pm

OS/2 - Karen Burns, OS/2 User Group,Cecily Hill Castle, Cirencester, Glos LG7 2EF Telephone 0285 655888

OSBORNE/CPM/MSDOS - Jeremy Browne BOOG, 102a Aldershot Road, Fleet, Hants GU13 9NY. 0252 621745 voice, 626233 BBS

PC/PD CLUB – 48 King William Drive, Cheltenham, Glos, GL53 7RP

PC SOFTWARE - PC Serve, 1147 Greenford Rd, Greenford, Middx UB6 0DP 081-864 2611, BBS 081-864 2633

PHILCSOPHY APPLE - G Haines, Chinese Room Club, 43 Cornwallis Gdns, Hastings, East Sussex TN34 1LX. 0424 714 102

PICK OPERATING SYSTEM - Hugh Kellt, UK Pick Users Assocn, PO BOX 907, London N10 2SB. 081-462 4666

PRESTEL - Andy Leeder, ClubSpot 810, Church Farm, Stratton St Michael, Norwich, Norfolk, NRQ15 2QB

PSION ORGANISER - Mike O'Regan, IPSO, 130 Stapleford Ln, Beeston, Nottingham NG9 6GB. 0602 735482

PUBLIC DOMAIN. Amiga disk fanzine specialising in public domain.Write, with sae, to Chris Jackman, 3 Albion Terrace, Lexham Road, Litcham, Kings Lynn, Norfolk, PE32 2QQ

RESEARCH MACHINES - Steve Rochford RM National User Group, George Stephenson High School, Southgate, Killingworth, Newcastle NE12 0SA. 091-268 2002

REVELATION (PICK) - Malcolm Frame UK Revelation User Gp, 136 St Albans Road, Watford WD2 4AE. 0923 35515

R:BASE - Mrs Tansy Beal, R:Base User Group c/o Room A2044 BBC Woodlands, 80 Woods Lane, London,W12 0TT. 081-576 7187

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SCHNEIDER EURO PC - Alex Kefford, SEPUG, 11 Crabbet Road, Three Bridges, Crawley, West Susex RH10 1NF

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SOFTWARE EXCHANGE – SAE for info 13 Bourneville Lane, Birmingham, B30 2JY or call 0860 444594 12-10pm

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SMART SYSTEMS USERS - Francis Barton, smart User Group, Basement Holy Rosary church, Louis Street, Chapeltown, Leeds LS7 4BP. 0532 629202

SOUTHERN AND DISTRICT. PC and ST user group.Tony Lowes 61A Broadway West, Leigh on Sea, Essex S59 2BX

SPECTRUM PLUS 3 USER GROUP – monthly magazine. 57 Lovers Walk, Dunstable, Bedfordshire, LU5 4BG

SPECTRUM DISCOVERY CLUB – magazine on disk for the Opus Discovery Disk Drive and the Sam Coupe. Details available from BD Mumford, 57 St Saviours Road, West Croydon, Surrey, CR0 2XE

STEN. The ST enthusiasts newsletter. Send a disk and an sae for a copy to Dave Mooney, 14 School Rd, Morningside, Newmains, Lanarkshire

STOS magazine, out every month.Send an SAE for full details to 11 Shore Crescent, Bishops, Waltham, Hants SO3 1DZ

SUPERPROJECT - Geoff Groom, 3 Sunnymeade Ave, Carshalton Beeches, Surrey, SM5 4JA. 081-643 3336

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TANDY/MS-DOS - Roger Storrs, NATGUG Oakfield Ldge, Ram Hill, Coalpit Heath, Bristol BS12 2TY. 0454 772 920

TEXAS T199/4a - Peter Walker, T199/4a Usr Gp UK, 24 Bacons Drive, Cuffley, Potters Bar, Herts EN6 4DU. 0707 873778

TEXAS T199/4a - Peter Brooks, International TI User Group 96 Banbury road, Oxford OX2 6JT. 0865 510822

THUNDERNEWS. CBM 64 user magazine on disk/tape. Send sae for details and competition to Thunderscrews, 159 Hough Road, Wallsall, West Midlands WS2 9BG

TIUGUK. TI99/4A user group UK for S/W on disk, tape and module. Offers magazine and help. Write with SAE for more details to Peter Walker, 24 Bacons Drive, Cuffley, Potters Bar, Herts EN6

TRANSPUTER - Howard Oakley, Transputer User Group, Brooklands Lodge, Park View Close, Wroxall, Ventnor, Isle of Wight

UNIX USERS - UKUUG Secretariat Owles Hall, Buntingford, Herts, SG9 9PL. 0763 73039 /73255 (fax)

VENTURA PUBLISHING - VPU (Ventura Publisher User grp) Linda Liddell VPU c/o LLA Lound House, Forncett St Mary, Norfolk, NR16 1JP. 0508 41580

WORDPERFECT - Michael Norman, Wordperfect User Group (UK) Dove Barn, Manor Farm, Wootton Woodstock, Oxon, OX7 1DX Telephone 0993 812 670

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Mgbbs	0443 733343	V21/23S
Micro Live Bb	081-567 6500	V21
Micro Update	081-877 1529	V21/22/22b/23
Microdeal	0726 65422	V21/22/22b/23
Microlog	0422 71921	V21/22/22b/23
Microview!	081-509 0729	V23v
Midget Gem	0748 834836	V21/23
Midnight Caller	0633 279243	V21/22/22b/23
Mind Boggles	0362 762868	V21/22/22b/23
Mininet 3	0642 672813	V21/22/22b/23
Miracom Support	0473 232540	Hst
Mirage	061-652 1242	V21/22/22b/23
Mirror Ii	0628 810889	V21/22/22b/23
Mirrorworld/quest 1	0883 844044	V23
Mission Impossible	0602 654329	Hst
Mk Board	0908 311005	V21/22/22b/23
Mkbbs	0908 504556	V22/22b
Monkey Tree	0952 677002	V21/22/23
Monusci	0293 545665	V21/22/22b/23
Motor Exchange	0484 435314	V21/22/22b
Multi-bbs	041-649 9043	V21/22/22b/23
Murdoch'S Hangout	021-711 2620	V22/22b
Murky Caverns	081-426 9386	Hst
Mwcfe	0926 421844	V22bis
My Little Phoney	0865 773277	V32/HST
Nicc Mid-west	0341 250377	V21/22/23
Nite Life	071-976 6807	V21/22/22b
No Escort Required	081-200 3817	Hst
No.1 Bbs	081-958 1689	V21/22/22b
Norpac	0434 608324	V21/22/22b
North Wales Bb	0978 88372	V21/22/22b
North Yorks Qbbs	0423 868065	V22/22b?
Northern Lights	0768 773685	V22/22b
Norwich Onion Bbs	0603 423305	V21/22/22b/23
Nova	0455 553371	V21/22/22b
Nova-net	0274 370760	V22
Odd-ball	081-679 2583	V21/22/22b/23
Open Access	081-427 3974	
Optix	0482 872294	V21/22/22b/23
Organic Garden	081-464 3305	V21/22/22b/23
Out Of The Blue	081-668 7667	V21/22/23
Owl Service	0532 605876	V21/23
P'S & Q'S Tel	051-236 3105	V21/22/22b/23
Pacific Lightning	0732 845338	V22/22b
Packet Bbs	081-547 1479	V21/22/2
Packet Place	0484 435620	V21/22/22b
Palm Beach	0303 265979	V21/22/22b/23
Pazaz Viewdata	0383 620259	V23v
PC Access	071-608 0081	V21/22/22b/23
PC Forum	0322 335348	V21/22/22b/23
PC Serve Shop	081-864 2633	V21/22/22b/23
PC Serve Softnet	0895 420164	V21/22/22b/23
PC Serve Storehouse		
	0494 728094	V21/22/22b/23
Pc-vax Opus	081-800-3549	V21/22/22b/23
Pcamiga Bbs	0602 735119	V22/22b
Peacenet West	0895 448998	V23v
Pecan Software Bbs	0272 248076	V21/22/22b
Penguin	0943 830820	V21/22/22b/23
Phantom	0226 340425	V21v/22v/23
Phoenix	0249 817704	Hst
Piston Popper	0424 853361	
Plug-ole	021-472 0256	V21/22/22b/23
Plus And Minus	0559 322766	V21/22/22b/23
Poacher	0476 62450	V21/22/22b/23
Polynet Bb	071-580 1690	V21/22/22b/23
Port Of Call	081-391 5779	V21/22/22b/23
Power Play Qbbs	0698 423669	V21/22/22b/23
Power Tower	0533 880114	V21/22/22b/23
Prestonet	0772 612462	V23v
Project Bbs	0384 401770	V21/22/22b/23
Prometheus	081-300 7177	V23v
Proximity	0793 480028	V21/22/22b/23
Publishing Shop	091-261 5228	V21/22/22b/23
Purely Pc	0232 645942	V21/22/22b
Pyramid	071-239 0871	V21/22/22b
Pyroto Mountain	0895 59071	V21/22/22b
Really Interesting	0582 414991	
Reflex Bbs	0703 685527	V21/22/22b/23
Regency Bbs	0542 33050	V21/22/23
Remote!pcw	0555 851887	V21/22/22b/23
Rivendell	0602 640488	V21/22/22b/23
Rm Tech. Support	0865 796431	V21/22/22b/23
Road Runner	061-483 4105	V21/22/22b/23
Roamer I	0292 45345	Hst
Royalink Uk	0962 66807	V21/22/22b
SAC Bbs	0242 260685	V21/22/23/22b
Sas Bbs	0742 325232	V21/22/22b/23
Satellite Southwest	0392 53116	V21/22/22b/23
Scabs	0909 479080	V22bis
Scary Monster	0734 320297	Hst
Scot Air	0505 36036	V21/22/22b/23
Scothelp-st	031-313 2734	V21/22/22b/23
Scottish Opus	041-880 7863	V21/22/22b/23
Scottish Wildcat	0674 671141	V21/22/22b/23
Scs One	0444 236002	V22b
Sector	0772 454328	V23v
Semaj Qbbs	0303 862415	V22/22b
Sentinel Bb	0628 781429	V21/22/22b/23
Shades	0342 810905	V23
Shadowfax	0252 528146	V21/22/23
Shadowland	081-897 0488	V21/23
Shareware Library	0424 83654	V22/22b
Shasby'S Lair	0772 561066	Hst
Sherwood Forest	0602 397113	V21/22/22b/23
Short Circuit	0273 462967	Hst
Sid (acorn Service)	0223 243642	V23v
Signal Box	081-337 6583	V21/22/22b/23
Sin Bin	0532 661536	V23
Sirius	081-542 3772	V21/22/22b/23
Sirius Ii	0494 778425	V21/22/22b
Skull's Tower	081-943 1194	V21/22/22b/23
Sky-line	0603 742273	V21/23/23v
Skyline 1	0234 741691	Hst
Softmatic Bbs	0733 322540	V21/22/22
Software Source	0892 661149	V22/22b
Sounds Of Mercia	0203 682896	V21/22/22b
South Lincs BBS	0780 63954	
Sparx	0793 480287	V21/22/22b/23
Split Infinity	0342 712248	V23v
Pook Bbs	0268 767365	V21/22/22b/23
Sphere BBS	0294 221350	V21/22/23/22b
Sputnik Spitfire	0501 31754	V21/22/22b
St London Bbs	081-443 2432	V21/23
Stabb	0793 855176	V21/22/23/22b
Staines Bb	0784 465794	V21/22/22b/23
Starbase One	071-733 3992	V21/22/22b/23
Strange Brew!	081-665 5038	V22/22b
Stun User Network	061-429 9803	V21/22/22b/23
Summer Wine	0484 653234	Hst
Sunburn Inc.	021-449 5269	V21/23
Super Ops Bbs	0782 284081	V21/22/22b
Swindon Newc Bb	0793 616683	V21/23
System-c-v	0403 50607	Hst
T.a.b.b.s.	0533 517615	V21/22/23
Tabbs	0225 743797	V21/22/22b/23
Taecomm	0994 6709	V21/23
Taff'S Retreat	0834 4562	V21/22/22b/23
Tardis	0772 27236	V21
Tasque	0355 222664	Hst
Tasug Opus	0904 760129	V21/22/22b/23
Tavern	081-445 6514	V21/22/22b/23
Tbbs-rovoreed	081-542 9767	V21/22/22b/23
Tequila Sunset	0703 867786	V23v
Terminal Net 5	0402 456135	V21/22/22b/23
Terminal-net	081-423 5262	V21/22/22b/23
Tharr Bbs	0234 261804	V22/22b
Third Wave	071-585 3163	V21/23
Three Kings	0354 56267	V21/22/22b
Track 83	0953 851351	V21/22/22b/23
Transylvania	0274 621668	
Tranz-com Bbs	081-952 6273	V21/23
Trinity I	0392 410210	V21/22/22b/23
Trinity Ii	0367 22764	V21/22/22b/23
Tug Ii	0905 775191	V21/22/22b/23
Twilight Zone	081-788 0884	V21/22/22b/23
Twilight Zone Ii	071-608 1485	Hst
Uk Healthlink	0942 722984	V21/22/22b/23
Unisys Etoi Bbs	081-453 5739	V21/22/22b/23
Unit One	0285 713688	V21/22/22b
V.i.t.a.s.	021-749 5860	V21/23
Valente'S Bbs	071-978 2078	Hst
Vector System	0329 45824	Hst
Viking East Anglia BBS		
	0255 503048 Rb	V23v
Village	081-464 2516	V21/22/22b/23
Village Fayre	081-841 5971 Rb	V23
Voyager Bbs	061-725 9580	V21/22/22b/23
White Lightning	0635 37259	V22/22b
Whitehall Pent	071-930 3903	V21/22/22b/23
Wild Imaginings	091-263 4303	V21/22/22b/23
Winchester Remote	0962 69322	V21/22/22b/23
Wolverhampton Ros	0902 745337	V21/22/22b/23
Womble Base	081-979 9606 Rb	V23
Woodgreen Bbs	081-889 5624	V21/23
Yugo Bbs	0734 753648	V21/22/22b/23
Zeus Bbs	0487 710487	V21/22

Black Country BBS is not so remote in the wilderness

Wolverhampton isn't one of the most inspiring places in the world but the ROS (Remote Operating System) is something of an oasis in the dull grey mixed metaphor.

Every BBS I log on to nowadays seems to be trying to flog something and Woverhampton ROS is no exception, offering Amstrad modems among other things. The fact that it runs 24 hours a day is another factor in its favour.

The board runs on a PC and has a comprehensive set of files and messages hopefully stirred on by a logoff message that warns that a BBS is only as good as its contributors.

ROS Facts:
Telephone number: 0902 745337
Speeds: 8N, V2, 22, 23, 22bis
Times: 24 hours

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DONCASTER	20 Cleveland Street. Tel: 0302 329999
LIVERPOOL	129 St Georges Way, St Johns Centre. Tel: 051 707 1931
PRESTON	11 Friargate Walk, St Georges Centre. Tel: 0772 882243
NEWCASTLE	46/47 The Green Market. Tel: 091 261 9050
BRADFORD	1 Kirkgate Mall, The Kirkgate Centre. Tel: 0274 308829
GATESHEAD	56 Garden Walk, The Metro Centre. Tel: 091 460 6054
NOTTINGHAM	Upper Broadwalk, The Broadmarsh Centre. Tel: 0602 586454.
WAKEFIELD	33 Kirkgate. Tel: 0924 376656
BIRMINGHAM	424 Grand Parade, The Bull Ring Centre. Tel: 021 616 1036
GOOLE	5 Pasture Road. Tel: 0405 763183

TECH TIPS

Does your PC keep packing up? Is your Amiga less than friendly? Would your ST try the patience of a saint? Write to Keith Pomfret's Tech Tips and we'll soon see you right. Send your sorry stories to Tech Tips, Beauford Place, 30 Monmouth Street, Bath BA1 2BW.

HELP! Spectricot/Aptrum

I own a ZX Spectrum Plus2, and Apricot PC (which I think is an ACT, as that is what it says on the motherboard) and I wish to know several things:

1) Can I interface the green monochrome monitor from the Apricot with the Plus2.

2) If I changed the Z80A and crystal in the Plus2 with a Z80B and the right crystal would the computer still work (and where is the Z80 in the Plus2 anyway)?

3) Is there any way to get an Epson printer to print hashes instead of pound signs?

4) If I got two new BIOS chips for the Apricot and switched them for the old ones would this make it boot later versions of MS-DOS and be more IBM compatible, and are there any problems with this operation?

Any help with any of these subjects will be greatly appreciated.

I read your magazine regularly and feel it is of a very high quality, please keep up the good work.

John Holcroft, Ballyclare, Co, Antrim

From the number of Apricot owners writing in in the last few weeks it looks as though we almost have enough for an Apricot column — although not quite enough. To answer your questions:

1) No, definitely not.

2) It might, but it certainly wouldn't work properly and there's nothing to be gain from attempting this piece of minor surgery. Besides, if you can't find the chip that you want to replace, do you really think that you're up to the job of replacing it?

3) That's a new one. It's normally the other way round with users wanting to dump the hash in favour of the pound. In simple terms, your printer driver is defaulting to a UK keyboard map. Somewhere in there there could be a hash but the simpler and more elegant way would be to use a US driver that replaces the pound with the hash. If you need both pound and hash and your UK driver doesn't have both, you'll need to define a hash character. As you haven't said which software you're using I can't even take a guess at the simplest way for you to do it.

You may find that joining one of the MS-DOS or PC user groups will bring you a wealth of answers to your problems. The *Express* On-line column should help you in that respect and if you scan the BBS list you'll find a wealth of help from the Apricot BBS. This is run by Apricot and is a fine example of a company offering round-the-clock support to its users and dealers.

4) You can carry on welding things to your Apricot forever but you'll never turn it into a PC. As you suspect, a change to the later BIOS will gently push it in that direction but it will never get there. An Apricot F1 in the office has gradually been upgraded until it has the final BIOS ROMS, but while it will now read PC disks and even attempt to run some of the earlier PC MS-DOS 2xxx software, it falls over at the sight of anything that has graphics — because the bespoke Apricot board doesn't recognise them.

HELP! Portfolio driver

I am the proud owner of an Atari Portfolio, and would like to know if there is any way to connect an external disk drive (not the card drives, but a 3.5 or 5.25-inch) to this handy machine. I seem to remember reading an article, in a previous issue of *Express*, which mentioned an interface developed by a German firm. Does such an interface exist — and if so who supplies it?

Edgar Janes, Harrogate, N Yorks

You are right. A drive interface for the Portfolio was mentioned some time ago but what with unification and all that, the Germans don't seem to have had any time to send the interface over — or if they have they've been quiet about it.

All may not be cloudy though. A Portfolio user group in the US was recently reported on the wire services to be developing drives and interfaces for Atari's babe. We'll keep them under the *Express* microscope and report when we've more details.

If you want a good source of information on Portfolio things, you could get a modem and go on line with Compuserve where you'll find a Portfolio specific area 17 yards long.

HELP! Dead ST

Since I have read your magazine from the start, I wondered whether you could advise me on a problem.

When I turned on my Atari 1040ST last week, all that happened was the red power indicator lamp came on and the rest of the machine seems dead!

Nothing comes on the Philips monitor screen, and when I insert a disk nothing happens.

I took it to my local repair chap and was told that a check had been done on various chips and they seem to have nothing wrong with them, and he said it was a mystery and could not fathom out what was causing it.

TIP ST publishing

In *Express* 99 you asked to see a mag produced on an ST, well here's one. Its a Dutch 'House' music fanzine, and it's produced on a Mega ST (see contents page). There are quite a few mags and fanzines produced on STs, I chose this one because there is a quality about it equal to some newsstand magazines.

I like the change in *Express* by the way. It's a much better magazine and I'll buy it every week again now.

I have enclosed an advert which I have sent in a couple of times and not had printed. If you could get it printed for me I would be grateful, you could even send me some ST stuff yourself if you like, in return for the cost of the mag and postage. Keep up the good work.

Steve Coles, St Leonards, East Sussex

april 1990
Wild!
HOLLAND'S GUIDE TO
original ART vital NEWS happening CLUBS

• Wild *– a Dutch magazine produced on the Atari Mega ST.*

Boogie, boogie, boogie: and to think I spent the last 42 years thinking that all the Dutch ever did was stick fingers in dykes. It's a pretty mag and one of several that disgruntled ST DTPers have sent us. While I was out in the USSR, I found a national computer magazine produced by a Polish-Soviet company that was done entirely on STs using *Calamus*. The interesting thing there was that they had the choice between a PC running *Ventura* or *Page Maker*, and the ST – and they chose the ST.

■ HELP! New machine

I am seriously interested in upgrading my Commodore PC-1 and in the past have often been encouraged by 'techies' to get an AT 286. But the cost still puts me off.

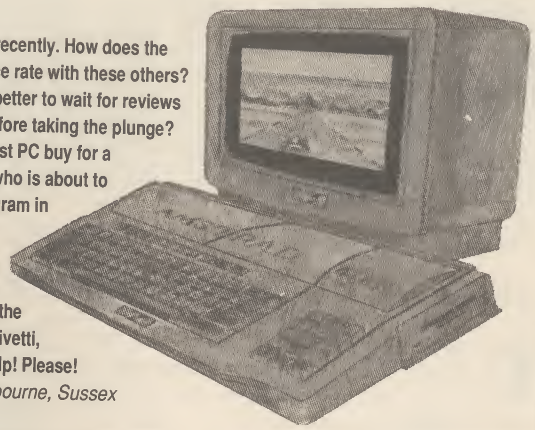
However, the recent announcement in *Express* of a new Amstrad 'games' PC4000 made me ponder. At a price of £399 with a 286 processor and VGA colour graphics it seems to be a very strong (silent) competitor for Amigas and STs. But since the main use for the PC is to do serious programming how, in your view, do you think the PC4000 might compare with, say, the existing Amstrad 2286? At this stage and on the given specifications, it raises questions. Why so much less expensive? What's the snag? Which posts, disk controller, or whatever have been left out?

The Amstrad PC scene is rather confusing right now with the 2000 range in the process of being replaced by the 3000s – and a big fanfare for doing the job right this time.

Also PC1640s are being offered at good discounts recently. How does the price/performance rate with these others? And would it be better to wait for reviews of the PC4000 before taking the plunge?

What is the best PC buy for a serious student who is about to learn how to program in UCSD Pascal? PC1640, PC2086, PC4000 or, with an effort, the PC2286? Or an Olivetti, Samsung or ... Help! Please!

John Gray, Eastbourne, Sussex



I haven't seen a 4000 yet and it will be some time before it makes any sort of impact, so there's no point in considering it in any equation until we know what its specification is.

Whatever PC you choose, you should be sure to pick one that is readily upgradable and conforms to the industry standard for a PC. If you're going for a 286 AT clone, pick one that can be simply upgraded to a 386 or 486. You may not need the upgrade but if you do, you'll be glad you left your options open.

Other things to look out for in your new machine are display upgradability. Be sure that the machine can be simply upgraded to VGA and that it has a good supply of serial and parallel ports.

Do you have any idea of what it may be, and would this be expensive to put right? Hoping you can help me.

P Olsen, York

Without the machine on the test bench, there's not much chance of diagnosing what's wrong. If you've got a mains light and not much else it sounds like a bad connection or a fuse but if your repair bod has looked at it and that isn't the case, I suggest that you change your repair bod.

Any one that purports to repair computers and can't fathom out what the problem is, cannot be the ideal person to effect repairs. Take your machine to a true diagnostic repair shop where they can do a proper job.

■ HELP! Sordplay

Although I buy *Express* from time to time I thought that at the age of 64 I was past involving myself in computers. But at a local church sale a small home computer was on sale for the massive sum of £3 and to help the church funds I bought it. To my surprise it works.

Can someone help me by telling me if there are still cartridges and cassette tapes for this machine? It is a GCL Home Computer model M5 from the Sord Computer Corporation. Any help would be much appreciated.

H Hargreaves, Market Harborough, Leics

We searched the *Express* annals but alas, no Sord (and not even a scabbard to put one in.) The Sord is a little out of date nowadays and we know of no one who still supplies documentation or software for it. We broadened our search and among the *Express* usergroups found hope in the fjords of Norway. There's a Sord User group run by B Nicholson, Schumberger, Norge A/S Bjergstedveien, 4007, Stavanger, Norway, 474 657002.

It's a long way for a visit but you may get some info back if you write. If there are any Sord wielding groups in the UK we'd be glad to hear from you and will include your details in our user group columns.

■ WIBBLE! Rhubarb

I am writing this letter not to get profit from it but get some words into (some) thick computer owner's heads. All this total crap about "My computer's better than yours", "The ST's better than the Amiga", "The PC's better than any other computer". It's all crap.

This is from a 14-year-old boy who has user experienced with almost every computer. I use an Archimedes at school everyday, a Spectrum Plus2 at home, both an ST and an Amiga at my friend's house – plus I used to own a C64. Any and I mean *any* computer be it a ZX81 or Amiga is good enough for anyone as long as they like it and enjoy using it. There's no point getting an ST when you want an Amiga.

Come on readers. Stop writing about the crap. I own a Speccy, compare that to an FM Towns! But am I complaining? I'm gonna purchase an ST at Christmas. I could get an Amiga but I don't choose to.

Think about it, get what you want and don't complain about other things. Anyway, thanks for a brilliant, cheap and wicked mag.

Umar Bashir, Milnsbridge, Huddersfield

I scanned the above letter and all I could find was opinion. There wasn't a problem or a tip in sight unless you consider gratuitous advice about what does or does not constitute dung to be a tip.

Letters that drivel on like this will be binned in future. If you want to wibble, write to Haydn in the letters page. This column is for those poor souls with dead or dying computers, hard and software problems, compatibility hassles and other hair pulling problems. Here endeth the lesson.

■ HELP! Sick Amiga

I bought my Commodore Amiga 500 second-hand about a year ago. My problem is that on most games my screen gets corrupted by black dots and shapes. The black shapes seem to form vertical lines as the screen scrolls and then return to smaller shapes again. At first I thought it was a virus, but was told by a friend that it is a hardware fault.

This theory is also backed up by the fact that the problem does not occur when the computer is switched on from cold until after a couple of minutes later. But it occurs straight away if I switch off and reboot. Could there be a fault in the memory? How do I cure it?

Please help me with this problem because I'm getting desperate and you're my last hope.

John Hill, South Normanton, Derbys

Don't plug it in again. Take it straight to a reputable dealer or repair person and let them fix it. It is indeed a hardware problem and should be dealt with by an expert. It may cost more cash this way but it's cheaper than the £400 it might cost to buy a new one.

■ HELP! Spectrum emulator

I have been considering purchasing an Atari STFM for Christmas but my parents do not like the fact that my existing Spectrum software will be incompatible with it.

Could you tell me if there is any hardware/software which will allow me to run my Spectrum games on an Atari as I have heard that this is possible on the Amiga.

Steven Iley, Banbury, Oxon

There's no Spectrum emulator for the ST (or at least we haven't seen one) Why not compromise and go for the SAM Coupé with its Spectrum emulation and better graphics, sound and expansion abilities.

SAM may have got off to a slow start but it seems to be tootling along now and if SAM Computers is to be believed, the userbase is growing by the hour. Try that one on your folks

■ HELP! Tandy Pandy

This in the fifth time I have written to you. Please could you help me with a problem I have with my Tandy 1000TL. You see, I am considering buying a 20Mb hard disk but the trouble is that I don't want to buy it from Tandy because it costs over £400 for a 20Mb western digital hard disk. Are there any other hard disks that will work my 1000TL (IBM-compatible)?

Lee Latimer, Sparkhill, Birmingham

There are two possible options in a situation like this. You can take the easy route which is to buy an external drive like the Megastor that plugs into the parallel port. The second (and cheaper) is to add a hard card and controller into one of the internal expansion slots.

To check compatibility of Tandy kit with peripherals and add-ons, give their cheerful technical help and recipe line a ring on 021-556 6101.

■ HELP! Stuck FAST

I saved for three years to buy my computer. Finally the Amiga arrived and I played the games in the pack. I saved up over a couple of years and bought several games of my own. Some friends came round from college and brought a program with them to copy my disks. I didn't like the idea but they persuaded me to let them 'back up the disks'.

Afterwards, all my own disks were corrupted and they refused to replace them. Who can I write to to get them nicked?

Alma Dvorak, Havant, Hants

The people that you need to contact are the disk police, better known as FAST (Federation Against Software Theft) The General at FAST is Bob Hay and FAST can be found at 2, Lake End Road, Taplow, Maidenhead, Berkshire SL6 0JQ – or you can phone them on 0628 660377.

■ HELP! New ruler

Is there a piece of software that I can get like *Sim City* that covers an entire country. I need to learn to run the country quickly and up to now, I've only been in charge of financial things.

Ideally the program should cover transport, war, environment, etc as well as treasury – and it should be cheap.

J. Major, Huntingdon

Is it real or is it Memorex? I get the impression that I'm being wound up, but just in case you're serious the programs you want are *Risk* or *Diplomacy*. Take your pick. ■

CIRCUIT CITY

Fitting PC emulator hardware inside your machine needn't be a tricky business. As an example Keith Pomfret opens up his Amiga and shows you step by step how to fit a new ATonce card.

The Amiga A500 has strayed a good distance from its original specifications, with peripherals that will take it up to nine megabytes of memory, add hundreds of megabytes of storage and even change its appearance to make it look like a conventional PC.

While Commodore entrusted big brother B2000 with a bridgeboard and PC capability a couple of years ago it looked as if A500 owners would be left out in the cold. A quick glance inside the A500's case showed that there was barely enough room for a formatted chocolate Hob-Nob, never mind a fully specified PC.

Earlier this year Bitcon surprised us with a PC/XT on a card that fitted into the memory expansion trapdoor underneath and turned an Amiga into a PC in five minutes. For those who don't mind opening up the Amiga to invalidate the guarantee, there's another solution that will turn the cream wedge of the A500 into a PC AT running a 286 processor. The Vortex ATonce for the Amiga board from Silica Systems can support hard drives, multi tasking and is capable of running MS-DOS 3.20 to 4.01.

The manual that comes in the box with the ATonce contains a photographic walk through of the installation and build up and instructions on how to do the job.

THE JOB

You'll need to be careful during this build up as there are sensitive CMOS chips on the board and a mere sniff of static electricity could wipe out your £199 investment.

The manual reckons that you should use earthing straps to avoid static. If you are going to earth yourself, make sure that you don't touch anything live or we'll be sending lilies.

The instructions provided in the box are comprehensive and concise and the job was simple to do using the manual and common sense. It can be undertaken by any dextrous person with an average capacity for reasoning.

BELLY UP

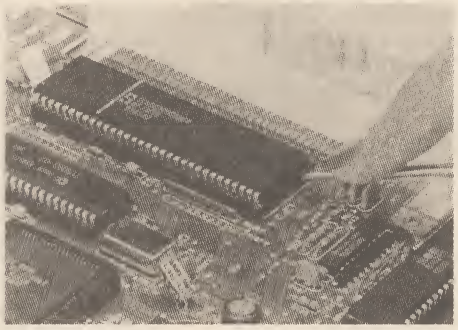
If you're following the advice, take all of the connectors from the back of the A500 (video, power, drives, printer, modem, joysticks, mice etc.). Place the A500 upside down on your workbench on an anti-static surface.Taking a cross-head screwdriver in your hand, invalidate any remaining warranty by removing the case retaining screws. Put the screws in the bowl that you've thoughtfully placed on the anti-static surface within grabbing distance.

WHOOPS

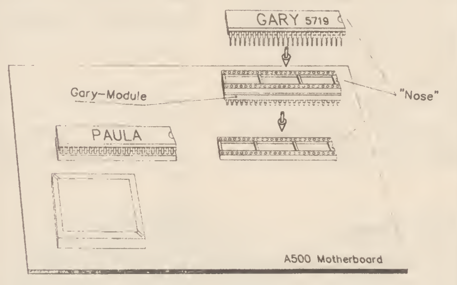
The next bit can be tricky as it's necessary to turn the Amiga back over so that it's the right way up. It's necessary to hold the top and bottom halves together as you turn it over and I find that the simplest way is to lift it over while gripping the sides

Once it's back the right way up the top half of the case should lift straight off. Put it somewhere safe where it won't be chewed by the dog or tripped over.

• Undoing the keyboard correctly



• Out with the old.



• Fitting the resistor socket between GARY and the brotherboard.

The next thing to remove is the keyboard connection cable. This *can* be connected wrongly so it's important to note which way round the connector is when you remove it. The 'I'll remember' method doesn't work. A tip I picked up from an auto electrician is to discreetly mark components that are being removed with a tiny spot of Liquid Paper or Snowpake or suchlike. If both sides of the join are marked, there can be no mistaking which way it fits.

TOOLS AND THINGS

To install the ATonce you'll need these:

- **Cross head screwdriver**
- **Flat head screwdriver**
- **Small flat-nosed pliers**
- **IC extractor tool**
- **Anti-static work area**
- **Bowl**
- **Thinking head (screwed on)**

Once you've marked the keyboard connector, remove the cable. Lift out the keyboard and place it in a safe place.The next component to come out is the metal shield that is held fast by metal tabs. The metal shield is made of thin sheet metal and should be treated with the same respect as a sharp knife. It's easy to get clothes snagged or even arteries severed with sharp things.

The tabs that hold it down can be eased off with your pliers. Be careful not to damage anything with the pliers. Remove the screws that hold it down and place them in the dish with the ones from the case. Place the metal shield where it can't be harmed – or do harm.

UP TO THE ELBOWS

The Amiga is on the bench in the same position as if you were using it. You must find the Motorola 68000 CPU. This should be on the left and is a large chip with 64 legs. (If it's on the right, rotate the machine through 180 degrees so that it is on the left.)

The 68000 must be removed from the Amiga. Although the instructions reckon that it can be done with a flat nosed screwdriver, an IC extractor is the proper tool for the job and should be used to avoid any damage to the 68000 and the Amiga.

Prising chips out with screwdrivers is a quick way to end up with sockets full of legs and legless processors. Once the 68000 chip is taken out it can be retained as a spare as it isn't needed anymore.

The ATonce board has a 64-legged connector underneath and this should be gently pushed home into the bare 68000 socket. It will only sensibly go in one way round. If you attempt to put it in the other way it will overhang the side of the board. There's also a socket with a resistor on it to put between the GARY gate array chip and the Amiga motherboard. The GARY, its socket and the resisted socket all have a notch in one end. Take note which end it's at when you're removing the GARY and be sure that all the notches line up when you place the resisted socket between GARY and the socket on the motherboard.

ASSEMBLY

That's the difficult bit done. Reverse the instructions to put it back together and all should be OK. One thing to be careful of is that the metal shield doesn't touch the ATonce Board. To be on the safe side, cover the bit of the shield over the ATonce board with insulating tape.

With everything back together the Amiga should be capable of doing things Amiga and PC at the same time. If it won't, there's a trouble shooting check list in the manual.

DEAD AND GONE

This job involves using earthing straps to avoid damaging CMOS chips with static electricity. If you are going to earth yourself you should be aware that if you touch anything live you will be at least hurt and at most dead.

This job doesn't need any mains power and you should avoid having any mains appliances within grabbing distance while you're doing it. Your good strong bench light should be set before the job and left alone until you've finished and taken off the earth straps.■

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THE PD COLUMN

The latest freebies available in the world of Public Domain include a surreal piece of animation and a disk of virus-busting software. Adam Waring casts a critical eye over these and also takes a look at two up and coming PD libraries.

Lotus Anim • Amiga (1 Meg) • Lorenzo's Domain • Disk 417

A quiet, empty road runs through the desert. There's nothing to be seen for miles around.

But what's this? A rapidly moving speck appears on the horizon. Is it a bird? Is it a plane? No, it's a car. Just about what you'd expect on a highway.

Anyway, as it comes into view you can see that it's a rather sporty little number, a Lotus Turbo Esprit no less. Ah, there's something else entering the picture now. Good lord! It's a unicycle, but there's nobody riding it! Spooky!

Oh no! It's heading straight for the road. Stop! Stop! Ho hum, it looks like they didn't hear me.

Lotus Anim is an entertaining little animation created with *Scuplt 4D*. It's pretty big as it has a great many frames, so you'll need an expanded Amiga to view it.

Virus Killing Disk • Amiga • Dozsoft • DS001

Be prepared. There's nothing worse than discovering that a virus has contaminated your entire disk collection.

You should always follow the usual precautions – setting the disks to write protect, switching off the machine between disks etc. But it's all very well being wise after the event. When you do find yourself with an unwelcome guest, then you've got to take steps to evict it.

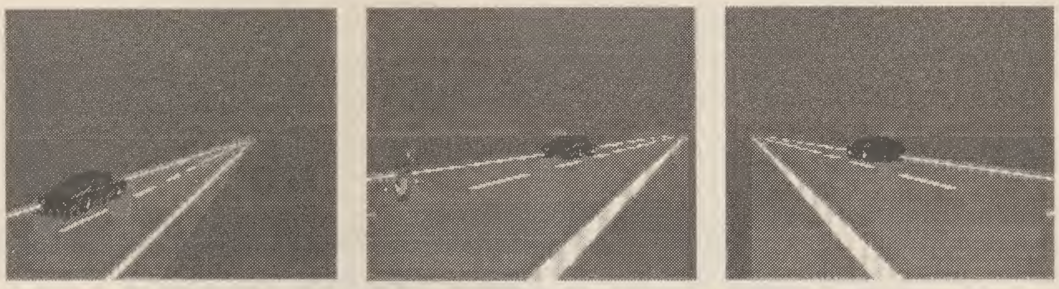
Dozsoft has compiled a disk full of the best PD virus killers around. It includes *VirusX 4.01*, *KDVIII*, *Virus Protector 2* and *Check Vectors.*

On boot-up *Check Vectors* checks your machine's memory for any tell-tale signs of infection. Hopefully the all clear message will be given. However, if this is not the case, then you've got some detective work to do.

You've been told that there's something lurking in your machine. The next step is to find out where it came from. This is the kind of task that the other programs on the disk are suited to.

The KDV in *KDVIII* stands for Kill Da Virus. It's written by the same chap who did the checker program, and works as a companion program. It searches for and destroys 41 known viruses by first checking your disk for boot-block viruses (the type that enter the machine on autobooting disks) then going through all the files hunting for trojans. (so called because they hide inside other programs – just like the legendary wooden horse.)

Virus Protector 2 installs itself in the memory of the machine and hides away quietly. Then whenever a disk is inserted, it keeps an eye on all disks you



• **Lotus Anim:** *Remember kids - always use the Green Cross Code or you could end up like this unicycle.*

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put in the drive and tells you when there's something amiss.

VirusX is probably the most comprehensive killer of them all. It's very easy to use as well. Just put a disk in the drive, and it'll check it. If it finds anything suspicious it'll tell you. When you've finished, click it off and the job's done.

All the programs on this disk come with full documentation. They are straightforward to use, and the combination of programs provided should help you eliminate most, if not all, viruses.

The effects viruses have vary wildly. Some simply do something silly, like turning the screen display upside down, and can have a limited entertainment value. Others are far more destructive, causing untold amounts of damage and trashing hundreds of pounds worth of valuable software.

A virus killer of some type is essential for all computer users. This disk should have all you need – so if you're not protecting yourself already, then do so now, before it's too late!

PD NEWS

Demos. You either love them or hate them. Well, actually we hate them. By far the most common type of software we receive here in PD land is the demo. And to be honest we're fed up to the back teeth with the things.

What's more, there's not a lot we can say about the usual kind of demos we receive: "In this one a message scrolls in a wibbly wobbly fashion across some nice pictures while some music plays." (Yawn.)

From now on, this column is becoming a demo-free zone. Well, free of the bouncy, scrolly, roly-poly message types anyway. We'd still love to see the more interesting types of demos, though. Good quality animations are welcome (like the *Lotus Animation*), as is anything funny, silly or unusual.

So keep 'em coming, but keep 'em interesting. Otherwise they'll be re-formatted on a PC and used as data disks for a spreadsheet (or some equally terrible fate).

GRIZZLY LETTERS

R&G PD is a fledgling little library that has been in business just one month. It supports the Amiga and has 70 disks already. The organisers hope that it will be well established by Christmas.

R&G has taken the unusual option of not providing the disk that your PD goes onto. Instead, you supply the disk along with your order. Because of this, prices are low. Up to five disks-full will cost you 80p a disk, five to ten will set you back 70p, while more than ten and the price drops to just 65p.

For a catalogue, which comes on disk, send 70p or a blank disk and an SAE. As well as the weekly updated list of software, you'll also receive Grizzly's letter disk; a simple word processor that allows you to edit letters (but not print them). If you just want a printed copy of the list just send an SAE and it's yours.

R&G can be contacted at 23 Melmount Gardens, Strabone, Co. Tyrone, Northern Ireland BT82 9EB.

PRETTY DISKS FROM NBS

NBS is another Amiga library, but has been going for quite a while now. It offers a full service including a fanzine, and is there to answer your calls during the day. The fanzine lists all the library's PD programs, and has news, letters and some pretty good competitions.

All NBS's disks cost just 99p, with a 60p postage and packing charge, no matter how many you order. All the disks have very pretty labels on them too.

You'll find NBS at 132 Gunville Road, Newport, Isle Of Wight, PO30 5LH. Telephone 0983 529594.

COMING SOON...

We're well into December now and the bumper Christmas edition of *Express* is looming. So here's a final reminder that we need your help in compiling a 'Best of 1990' PD feature in which we'll be listing the top ten PD packages for all major machines over the last year.

Now it's just possible that I may have missed out one or two of the best PD programs around. So if your library has a mega PD program that hasn't been mentioned in the column, then I'd very much like to see it. Whatever machine you cater for, I need to see the best you've got. Send your stuff to: Santa's PD Column, *NCE*, Future Publishing, 30 Monmouth Street, Bath BA1 2BW. ■

WHERE TO GO

Dozsoft, 32 Benedict Drive, Bedfont, Feltham, Middlesex TW14 8JL. No, no wake up! Dozsoft is an Amiga library with disks packed with interesting programs. Prices are set at: 1–5 disks, £3.00; more than five, £2.00. Oh, and that includes P&P.

Lorenzo's Domain, 30 Colquhoun Square, Helensburgh, Scotland G84 8AQ. This Amiga library has a very 'clubby' feel. Competitions are run regularly, and it aims to send out your disks within a couple of hours of receiving your order. The disks are dirt cheap too – just 99p is all it costs for a disk full of delightful PD.

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Computers aren't just for playing games, there are hundreds of more serious uses you can put one to, and some off-the-wall ones as well. So if your CPC is doing the air traffic control for Heathrow or running the reactor at Sizewell A then drop us a line.

If your computer is a bit unusual, drop us a line with the details and a picture to: Outrageous Machines, New Computer Express, 30 Monmouth Street, Bath BA1 2BW. Include a stamped self-addressed envelope if you want your pictures back. The most amazing entry in the five categories we receive by January 20 will each win a brand new £50 note.

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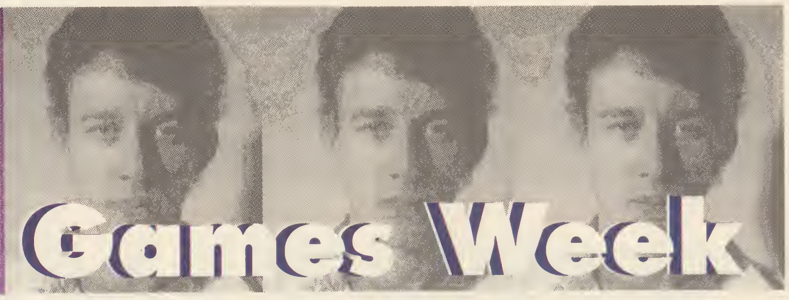


MARK HIGHAM'S Games Week

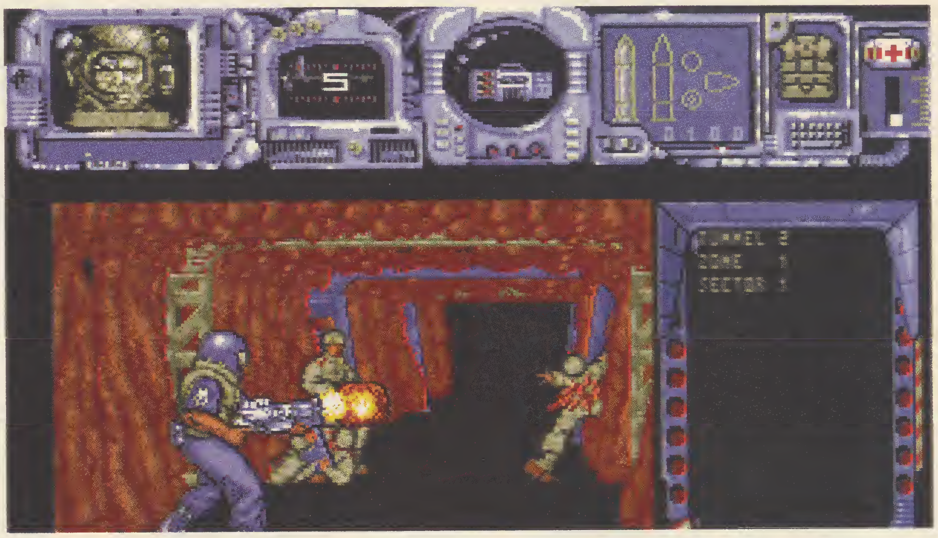
TRIGGER HAPPY

Shoot-'em-ups are certainly ruling the roost at the moment. The latest to receive an airing comes from Spanish programming house Dinamic which has released a continuous stream of shoot-'em-ups over the years on all formats. The trouble with the company's games is that they tend to be very traditional. *Army* and *Navy Moves*, *Satan* and *AMC* were all straightforward scrolling platform games where the objective was simply to blast everything that makes a move. In *Narco Police* they've tried desperately to come up with something different but rest assured, this is still a shoot-'em-up.

In *Narco Police* the objective is to send three teams of men into underground tunnels in a bid to work your way through to the centre of an island. But this isn't a simple maze game. As you're walking through the tunnels scores of territorial army recruits leap from behind rocks and tumble out of the roof. They squeeze the trigger on their sub-machine guns and mercilessly aim in your direction. It's up to you to dodge their fire and blast back as fast as you can.

The action continues like this through much of the game (well, I told you it was a shoot-'em-up) but what makes *Narco Police* different from other games in this genre is the size and quality of the graphics. Just take a glance at the accompanying screenshot to see how realistic the blasting looks. The Amiga version is the most playable. Sadly on the ST the animation isn't as effective and the games response to the joystick is annoyingly slow.

Narco Police is due out on Atari ST, Amiga, CPC, C64 and Spectrum now.



• Get that gun out and splatter some blood and guts about in Dinamic's latest and very different shoot-'em-up.

CARTOON GREATS

Here's some exciting exclusive news from Palace. Since the release of *Voodoo Nightmare*, Palace has been suspiciously quiet with no big Christmas releases planned at all. However, in March it is set to release an adventure going by the mysterious name of *Demoniak*. It's a text-based adventure which comes as something of a shock considering how adventures have advanced away from a text base over the last few years. The reason for this odd move is that Palace has got hold of someone very special to write the text. Alan Grant used to work for the cult comic *2000 AD* writing the scripts for *Judge Dredd* and later *Batman*.

Palace are keeping quiet about the game for the moment saying only that you can play any of four characters and read the minds of other characters in this hell-bound adventure.

Demoniak is being release for the Atari ST, Amiga and PC next March, with eight-bit versions following later.

GAMES REVIEW

ALL IN A WHIRL IN A SPINDIZZY WORLD

SPINDIZZY WORLDS

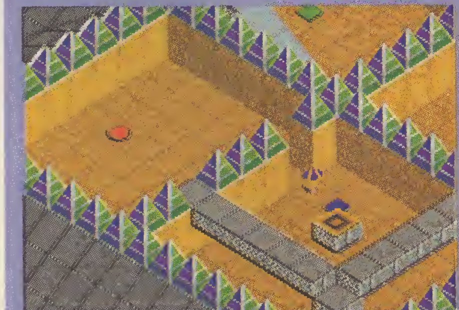
ACTIVISION £24.99, ST, AMIGA, PC

You're driven ga-ga by cutesy games; shoot-'em-ups feel more like throw-ups; sports games leave your throat sore. *Spindizzy Worlds* isn't completely radical but it does make a welcome change from the rest of the mediocre platform and blast games around at this time of the year.

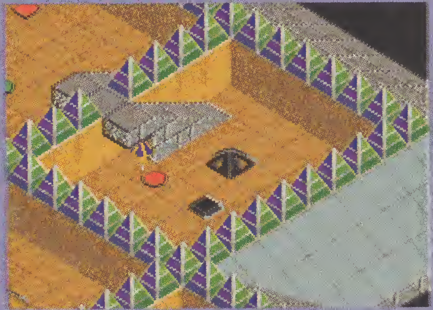
Spindizzy is a puzzle game with a very distinctive arcade element which keeps you rooted to your seat. The game is played with GERALD (Geographical Environment Reconnaisance And Land-mapping Device) and your task is to solve a multitude of puzzles within various worlds. Before you can even think about solving any problems you first have to overcome the problem of controlling GERALD.

GERALD is a spinning top and each time you make a move he swings round to the direction you indicated rather than making a straight line. The levels are arranged as a multitude of connecting paths floating in outer space. You regularly encounter hills and slopes and can easily fall from the paths and die so it's important to learn how to control GERALD through these obstacles.

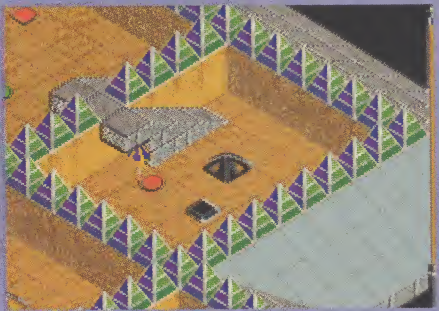
Your task is always to find a route from the start of a level all the way through to the next. In early levels this involves racing round at top speed in an attempt to beat the clock. Later on things become more complicated. You might need to pick up several gems to open a door to the next level. Often you need to hit a variety of



• When you move GERALD over the switches, paths come up. Now carefully guide GERALD up the path and into the next room.



• Eventually you reach the end of the level. Notice the raised square block in the last room, this transports you onto the next level. There are as many as 15 levels to each of the 23 worlds.



• Now what do you do? You need to collect each of the gems before an exit to the next level appears but GERALD cannot jump so how do you bring the gems down? Switches are the answer.

ALL FORMATS 8-BIT TOP TEN

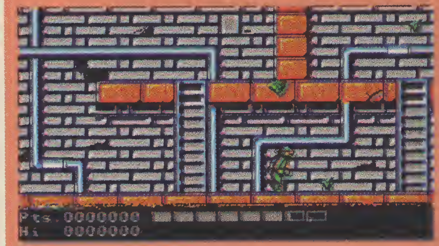
I'm printing the 8-bit charts for a change this week because the Turtles have now hit the shelves and have gone straight into the number one slot. This proves that anything with a turtle on it sells at the moment. The big question though, is how good is the game? By next week I'll have had time to play all formats of the game and be able to give you a full review of the ST and Amiga versions.

Chart for the week ending 24th November:

1	(NE)	*Teenage Mutant Hero Turtles* (Mirrorsoft)	SP AM
2	(1)	*Back To The Future II* (Mirrorsoft)	SP CO AM
3	(2)	*Hollywood Collection* (Ocean)	SP CO AM
4	NE	*Golden Axe* (Virgin)	SP CO AM
5	(3)	*Shadow Warriors* (Ocean)	SP CO AM
6	(5)	*Wheels of Fortune* (Domark)	SP CO AM
7	(8)	*Midnight Resistance* (Ocean)	SP CO AM
8	(12)	*World Cup Soccer '90* (Virgin)	SP CO AM
9	RE	*Monty Python* (Virgin)	SP CO AM
10	(9)	*Gunship* (MicroProse)	SP CO AM

SP – SPECTRUM, CO – COMMODORE 64, AM – AMSTRAD

Chart compiled by GALLUP. © European Leisure Software Publishers Association.



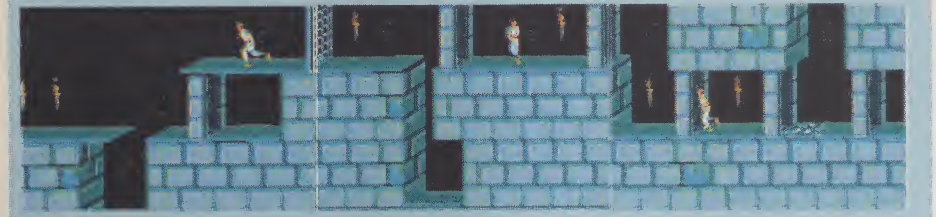
• Turtles on the ST. There's no sign of the Turtles in the 16-bit charts yet – but give them time.

PLEASANT PUZZLING IN PERSIA?

Last week, to the surprise of no-one more than Domark, programming team Broderbund completed the ST version of *Prince of Persia.* Until now everyone thought the Amiga version of the game would be the first to be released, possibly after Christmas. Now Broderbund has completed the ST version and I can tell it's damned amazing.

Persia is a puzzle game in which you play the role of an adventurer who must leap over the correct tiles and activate switches to reach the magic sword. When you find the sword you need to go all the way back and slay the end of level assassin with the sword. All of this action uses the most incredible animation you've ever seen in a 16-bit playable game.

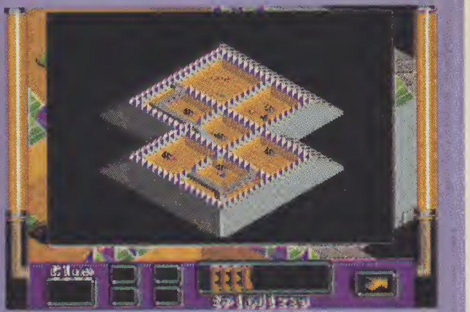
The ST version is due for release just before Christmas. The Amiga version is now due to follow in February. For further details you can contact Domark on 081-780 2222..



• Prince of Persia uses the most detailed, smooth animation you've ever seen. Look at these three linked screens to see just a glimpse of the number of frames used when walking. Similar detailed graphics are used for jumping, sword-fighting, climbing and falling.

switches to call up pathways through a level or direct GERALD across narrow bridges.

All of this action takes place against some enormously colourful and lively backdrops though the main playing sprites tend towards miniscule. This is still a very easy game to get into, largely owing to the heaps of practice screens available to test your command of GERALD. The hosts of puzzles in each of the 23 worlds keep *Spindizzy Worlds* addictive for weeks on end. Who wants to bet that next week I get a letter from some bright spark who gave up eating, drinking and sleeping and managed to complete the game in six days?



• At any point in the game you can hit the spacebar to pause the game and call up a map showing the complete level. In this one you can just about make out six bonus gems to collect and a number of switches.

PLAYING TIPS

F-29 RETALIATOR
OCEAN

This week I have some superb advice for mastering *F-29 Retaliator* but I've sadly lost the name of the author. Sorry about that. If you want to see your name to appear in print write in with your games tips to *Express*, 30 Monmouth Street, Bath BA1 2BW

TAKING OFF

Change your MFD to Systems so you can easily see your speed and thrust. You can immediately take off your brakes without moving. Increase your thrust to 80 per cent and take off when you reach about 200 mph. Retract your landing gear before you reach 250 mph.

TANK BATTLES

Weapons needed: 1 External fuel tank, 2 CSW's, 6 Mavericks.

Fly in slowly and low lining up to the tanks when they first appear as tiny dots. When the dots change to the real thing let loose with a CSW to effectively blanket bomb the whole area. If any remain repeat the process. If after this mass slaughter a couple are still active use the Mavericks. Don't worry about hitting your own tanks because it's impossible .

SEA BATTLES

Weapons needed: 1 External fuel tank, 1 MRASM, 1 CSW, 6 Mavericks or 8 ASRAAMs.

Fly in at 200 – 300 ft in Stealth mode. Wait until you are extremely close and fire a MRASM at the hull. All going well it should sink. If not repeat using CSW's and Mavericks. If the mission also involves planes replace the Mavericks with ASRAAMs. Enemy ships are identified by the red stars on their decks.

PLANE BATTLES

Weapons needed: 17 ASRAAMs.

Switch to stealth and fly in at about 200 ft. Fly straight for a MIG which will appear as a flying dot. It should be being tracked in the target designator. When it tranforms into a plane fire two ASRAAMs. This should get it if it doesn't take evasive action as it will do its Kamikaze act and fly straight for you. Turn around and head off for another dogfight making sure one doesn't get locked in behind you as you will stand little chance.

BRIDGES, BUILDINGS AND OTHERS

Weapons needed; 1 External fuel tank, 2 CSW's, 6 Mavericks.

Fly in stealth to avoid the SAM's. Fly straight for the target and let rip. Easy!

MISSILES

If a SAM sight, plane or ship fires a missile a notice will come up warning you. Reduce your speed, go into a dive releasing chaff and then spin all over the place and it will quickly disappear.

LANDING

Centre your aircraft on the middle of the runway and reduce your speed to 140 mph, then lower your flaps and gears. Reduce your altitude to 200 ft. When you are directly over the runway slowly reduce your height till you touch down. Reduce your speed and mission complete!

RETALIATOR

• F-29 Retaliator: we have the tips to make you invincible.

CONSOLE ZONE

In this week's guide to console gaming Richard Frederick takes a look at a top notch conversion for the Megadrive and discovers a fruity game for the Nintendo.

SQUADRON BATTLES ONTO THE SEGA MEGADRIVE

Electronic Arts has converted one of the best Amiga vertically-scrolling shoot-'em-ups onto the Megadrive.

Battle Squadron, originally created by Innerprise, features two-player simultaneous team play and coin-op style graphics. The player has to face a wide variety of enemies ranging from mysterious chameleon ships to mutant cybersnakes and terrifyingly ferocious nitrogunners.

Battle Squadron scrolls in both vertical and horizontal directions and has many special features. Weapons can be upgraded or changed when you capture jettisoned munitions from destroyed Barraxian gunships. Rob Hubbard, the famous ex-C64 music programmer, handled the music conversion.

Battle Squadron will be available at the end of December for £39.99 (9997 yen).

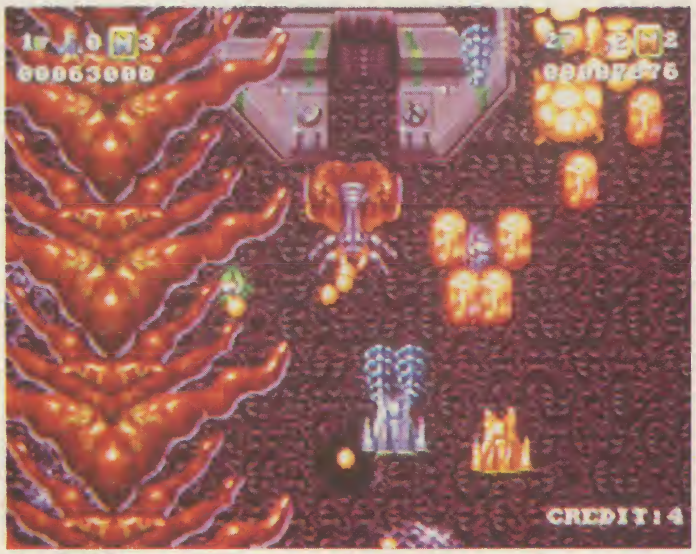
NINTENDO GAMEBOY

As Capcom is well in with Nintendo and Walt Disney, it was inevitable that *Duck Tales* would be converted over to the Gameboy. This lively arcade adventure game contains all the delightful Duck characters from the cute cartoon series and costs 3300 yen (£13).

NEC PC ENGINE

NEC has finally converted *Out Run*, the cult Sega racing-game, onto the PC Engine. Blue skies, an open road and a beautiful girl sitting at your side in an open-top Ferrari, what more could you possibly ask for?

Out Run on the PC Engine packs most of the original's immense range of sprite graphics into a four-megabit cartridge costing 7200 yen (£29).



• **Battle Squadron:** ***now available on the Sega Megadrive.***

By the way, did you know Enzo Ferrari, the esteemed father of the famous sports-cars, wanted to be an opera singer before he became a top racing driver and car designer? Well, you do now!

NINTENDO ENTERTAINMENT SYSTEM

Do you, Sir Cucumber, take this Princess as your lawfully wedded tomato?

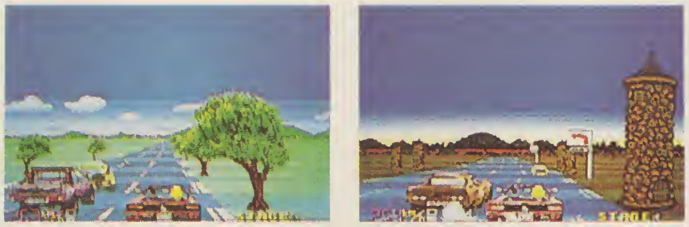
So begins one of the weirdest video games ever released. *Princess Tomato in the Salad Kingdom* is a whacky interactive videotale for the Nintendo Entertainment System. Publisher Hudson Soft is a top Japanese games house better known for its PC Engine games like *Gunhed.*

In *Princess Tomato* the bride is ripe and the groom is ready. But will Sir Cucumber and Princess Tomato really live happily ever-after? Or will Minister Pumpkin put Sir Cucumber on ice and enslave the Salad Kingdom? Only you can prevent Princess Tomato from winding up on the tip of a chip. The fate of the realm is in your hands.

SEGA GAMEGEAR

A steady supply of software is already starting to appear for Sega's GameGear, the latest addition to the console range.

One company getting in on the act is Sigma Enterprises which will be releasing a new golf simulation on the machine at the beginning of February. *Super Golf* is a fun golf game which should appeal to all armchair Faldos. It will cost 3800 yen (£15). ■



• **Out Run:** ***maybe your only chance to ever drive a Ferrari.***

THIS WEEK'S HIGH CONSOLE SCORES – CAN YOU DO ANY BETTER?

We're looking for the greatest video game players in the country. Send us your top scores on the latest games released on all console formats to the usual address.

GAMEBOY		
Batman	424,060	Peter Worth
Super Mario Land	474,170	Jay Lee
Tetris	396,064	Peter Worth
MEGADRIVE		
Eswat	277,900	Alex Taylor
Forgotten Worlds	1,843,000	Wai-Yin Man
Ghouls 'n' Ghosts	750,000	Tim Walker
Golden Axe	414.5	Alex Taylor
Moonwalker	1,020,360	Nicholas Wells
Rainbow Island	1,760,980	Nicholas Wells
Super Shinobi	5,890,200	Wai-Yin Man
Thunderforce III	3,564,100	Nicholas Wells
LYNX		
California Games (BMX)	798	Nicholas Wells
California Games (Footbag)	100,743	Nicholas Wells
California Games (Halfpipe)	32,025	Nicholas Wells
California Games (Surfin')	8,100	Nicholas Wells

PLAYING TIPS

NINTENDO ENTERTAINMENT SYSTEM
Continue being a *Trojan* by simultaneously pushing [Up] and [Start].

NEC PC ENGINE
Get some extra *Legendary Axe* continues by simultaneously pushing down [Button I], [Select] and [Left].

SEGA MEGADRIVE
Climb the mystery ladder in level one of *Ghouls 'n' Ghosts* by standing in the centre of the screen, jumping straight up and continuously twisting the joypad to the left and right. Now you find that you'll be able to climb the ladder!

ATARI LYNX
Feel some fractals in *Chip's Challenge* with this MAND password – you'll get a demonstration of the Mandlebrot Set. Who said video games don't have any educational value?

NINTENDO GAMEBOY
The first three passwords to *QBillion* are WALL, IDEA and NOON.

SEGA MASTER SYSTEM
Select the *Space Harrier* soundtest then play tunes 7, 4, 3, 7, 4 and 8. When you exit the soundtest you are now able to select reverse joypad control, alter the difficulty setting and turn your hero into a plane.

ZONE COMMENT

Have you found any hidden features in your new games? What do you want from the next generation of console hardware and software? We want your views on any subject connected with console gaming.

We're also after your tasty tips, crafty cheats and hot hints for any console games available. Send everything to: The Console Zone, *New Computer Express*, Future Publishing, 30 Monmouth Street, Bath, Avon BA1 2BW – or fax 0225 446019.

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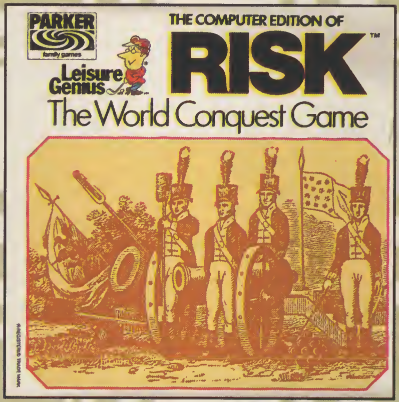
PARKER family games
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RISK™
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RISK

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	IBM PC	AMIGA	ATARI ST	CBM 64 DISK	CBM 64 CASS	SPEC +3	SPEC CASS	AMS DISK	AMS CASS
SCRABBLE DE-LUXE	●	●	●	●	●	●	●	●	
MONOPOLY DE-LUXE				●	●				
CLUEDO MASTER TEC	●	●	●						
DIPLOMACY	●								
RISK	●	●	●	●	●				

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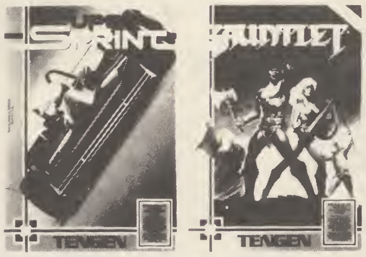

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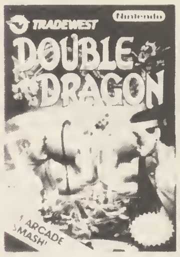

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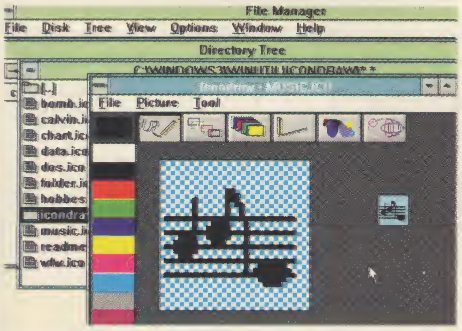
ON-LINE OFFERINGS

Keith Pomfret rang up the billion or so phones on this planet and chose the best ten on-line services for your perusal.

Bulletin boards, commercial information services, military computers, bank networks, they're all on-line services, but since the Computer Misuse act came along, we're restricted to the bulletin boards and those commercial services that will let us in. The available on-line services fall into four main categories – information, entertainment, mail/file forwarding and those which provide some or all of these.

The pure information providers are usually subscription services that may provide business or travel information or suchlike and often require the use of dedicated phonelines and/or equipment. These can be simple information providers or interactive systems that allow data input as well. Examples of these would be a financial service that shows stock, share and company prices (simple) and a computer link in a travel agency that displays holiday details and allows the travel agent to input bookings, etc. Normally, these services would be provided in the Viewdata format (like those colourful blocky screens on Ceefax and Oracle).

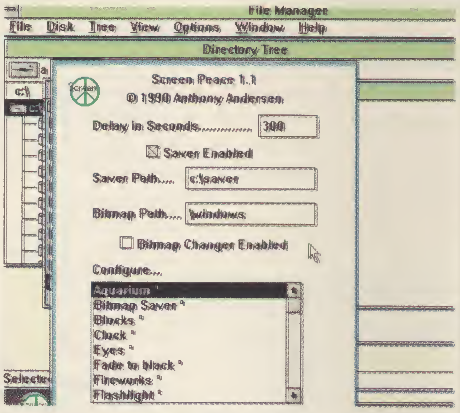
The entertainment angle is generally covered by small areas on larger services. In the US there are bulletin boards (BBS) and even some commercial services dedicated to entertainment. In the UK a dedicated entertainment service is rare. Entertainment can be in many forms. There may be on-line quizzes or interactive games such as *Dungeons and Dragons* and even space trader style game.



• *Free software is available, but you may have to hunt for it.*

Mail and file forwarding is the domain of all BBSs and a good many of the commercial on-line services too. Some of the smaller BBSs act as a simple forwarder of messages files and ideas.

Most of the on-line services currently available offer some of the above three categories with the emphasis placed on certain areas. A commercial system will remain firmly in the areas that are commercially viable, while a privately owned non-subscription BBS run by a Sysop (system operator) as a hobby might delve into more specialist subjects.



Screen Peace 1.1
© 1990 Anthony Andersen
Delay in Seconds............... 300
☒ Saver Enabled
Saver Path.... c:\saver
Bitmap Path.... \windows
☐ Bitmap Changer Enabled
Configure...

• *Windows utility downloaded from a BBS*

The ten bulletin boards that we've picked out won't suit everyone but we've tried to choose a good selection. Where a commercial on-line service is mentioned, a voice number is given and you should make sure that you're aware of all the relevant subscriptions and charges before you join up and log on. Some on-line services (particularly the commercial ones) have gateways within them. A gateway is a path to another distinct area offered by the on-line service. One thing to be wary of with gateways in commercial on-line services is that they sometimes lead to chargeable areas only available for a fee. With a commercial on-line service, this could mean paying for your telephone call, on-line time and then a further supplement for the use of the gateway and what lies beyond it.

VALUE FOR YOUR MONEY

Some of the commercial services offer little for a lot and you can end up paying more to go on-line than you would for commercial software. In contrast, some of the on-line services that aren't run for commercial gain offer a lot for a little.

"Sysop and comms journalist Mal Arnold told us about setting up his on-line magazine, The Owl Service and *Comms Plus*, its printed sister:

"The Owl Service came out of a combination of elements. A fascination with the on-line medium – with Comms itself – which grabbed me even before I got my first modem. The whole buzz of being able to tap the keyboard in my study and operate someone else's computer hundreds of miles away! Sci-Fi stuff! Sheer magic!

"Then there was the role of the sysop as Enabler. Providing a service for enthusiasts. A forum for communication, information and advice on all sorts of subjects. There's something peculiarly satisfying about seeing the board chugging away with someone logged on who doesn't want to chat to me. They are there because they're continuing conversations with others who regularly use the Owl. We (Jim Trash – the Remote Sysop – and I) can step back for much of the time. We're there if we're needed, sure, but it's good to see the Owl providing a 'bridge' for all sorts of people talking to each other. Systems where all the chat is directed to and from the sysop might be seen as glorified answerphones!

"Last, but not least, a bulletin board is rather like publishing a newspaper or magazine. In setting up the Owl we had this in the back of our minds. The different sections could be thought of as different sections in a magazine. The Newsletter file at the front end of the board is the Editorial Column. The textfiles in the different file areas are the articles and features. It's a strange sort of mag, though, because the 'Letters' take up the majority of space (the Message Areas), and where the programs for download fit into the scenario, I have no idea! (*Reader offers, perhaps – Ed.*) There is always a sense of audience in producing menus and textfiles for the board. We have an eye to the style of presentation, as well as the content.

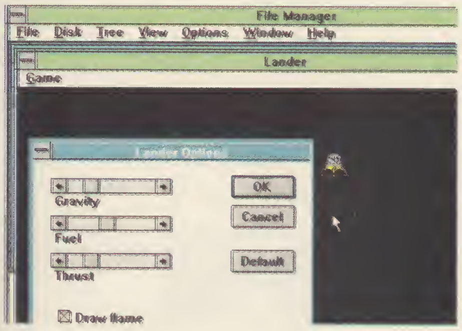
"Within a month we should be linked into FidoNet, providing international echomail possibilities!

"The future? More and Better is the cry you'll hear from all sysops. For us an urgent priority is more storage space. What we have at the moment is all on just 20 Meg! It's not too bad, as we don't see loads of downloads as a major priority on the Owl – being more interested in chat and textfiles – but more space would allow the inclusion of more features. One of the things we're determined to do is to add at least one more line as soon as we can. *RemoteAccess*, the software we're now using, already supports multi-line access. And we'd like to take a serious cross section of echoes".

EXPECT ASPECTS

Another popular BBS is Aspects in Manchester. Aspects began as a BBS for Amstrad and Spectrum users, but has evolved via a commercial CPM machine to the powerful PC that it lives on today. A letter dropped in Sysop, Dave Gorski's mailbox, brought this reply:

"We currently cater for the PC, Amiga, ST, Archimedes, CP/M and Spectrum machines, with over 132 megabytes of the best in PD and shareware. This has to be the place to be if your new to comms (it's an easy system to find your way around) and an ever helpful and patient Sysop (*modest! – Ed*). With off-line readers available for nearly all machines, users phone bills can be kept to a minimum. Perhaps the best feature of all is the other users of the system, who are always willing to answer messages and break into chat with the new users (assuming they leave a message in the first place). Finally, how do you get your Aspect?....Bend down in a chicken run".



• *Free icon designer in the download area of a US BBS.*

And to prove that Dave's not biased, all users of Aspects BBS get treated to this list of his favourite BBSs to call as they log off Aspects.

Digital Info Exchange	061-434 9907	(250/103)
Look Northwest	0282 698380	(250/116)

Mektronics	061-773 7739	(250/119)
Merkinstead	061-434 7059	(250/102)
NWW Dungeon 13	061-873 8314	(250/110)
Pussycat	061-236 0351	
Road Runner	061-483 4105	(250/101)
Seven Seas Opus	061-442 6758	(250/113)
The Gas Lamp	0706 358331	(250/104)
The Growling Grizzly	0772 828975	(250/121)
The Music Studio	061-727 7164	(250/118)
The Pig Pen	0706 821837	(250/124)
The Stun User	061-429 9803	(250/123)
Time Tunnel	0204 596245	(250/106)
The Voyager	061-725 9580	(250/111)

The numbers at the end in brackets: (250/111) for example are net numbers. Many BBSs pass messages between them so a message left on aspects for the attention of a user of Merkinstead would be passed on during the daily transfer of mail. The net system means that a message can leap from BBS to BBS around the net until it lands where it is directed to. Thus for a local call to a Bath BBS I could send mail to a friend a continent away in the USA, Australasia or even Moscow.

NUMBERS

•Aspects	061-792 0260 V21/22/23/22bis 8N1	Dave Gorski
•The Owl Service	0532 606128 V21/22/23/22bis 8N1	Mal Arnold
•Micronet	0272 250000 (Local node for Bristol check for local nos. and speeds)	
•Compuserve	(Linkline-Voice) 0800 289378	
•CIX Customer Support Number	071-390 8446	
•Bath BBS	0225 835841 V21/22/23/22bis 8N1	
•Mouse To Mouse	0233 643450 V21/22/22bis 8N1	
•01 For The Amiga	071-377 1358 V21/22/23/22bis 8N1	Tony Miller
•AST On-Line	081-847 5389. V21/22/23/22bis 8N1	
•Loony Bin	0703 787489 V21/23 7E1	Mike the Wizop

And of course you can contact *Express* on line via the services on page 10.

LUNAR SEA

The Loony Bin is the area on-line for all those people with a sense of humour that goes beyond the mere amusing. An editorial toe-dipping in its wards had the *Express* editorial staff wondering about virtual reality and even real reality.

We earwigged a couple of conversations in the message area in order to be fully committed. This is what we found:

```
Message: 273 (Private) 11-09-90 1:52pm
From: John Major
Dear anyone . . . me and me mate Jason are
making a spoof aussie soap opera called
"Neighbours of the Young Doctors meet the
cast of Home and away at Prisoner cell
block H with the help of the Sullivans".
Now what I would like are any unsensible
suggestions as to plots. . .character names
. . .deliberate continuity errors. . .wob-
bly scenery etc. . .if any one can help I
would appreciate it greatly. . .no finan-
cial reward as such. . .but then money is
not everything is it! Anyway thanking you
in advance. . .if everything goes to plan
the thing should take about three weeks to
film . . on and off . . so when (if) I fin-
ish I will upload the script . . .thanks
for any help et. . . Rob Skippy Scott . .
..
```

```
Message : 288 [Open] 11-29-90  8:58pm
From    : Wizop
To      : All
Subject : My mouth is full of wisdom...
Sig(s)  : 1 (General)
Hello folks... back in town for a few days
to have my mouth amputated. I bring good
news with me though, there's a very good
chance I'll be investing in a new modem,
(maybe even two... cor...) and a hard
drive. This is all dependant on electricity
shares doing moderately well, and my abil-
ity to resist buying a new motorbike or a
lorra hi-fi gear.Anyway, keep a look at the
speeds, we may make v22bis yet.
*Wizop*
```

TAKE A BATH

Languishing in the pleasant Georgian crescents of Aquae Sulis is ST based Bath BBS. As well as the normal features and file areas normally associated by privately run on-line information services, Bath BBS has a gateway to the Goodman PD library, a well known ST source of information

The message areas are full of lively chatter, the files are supplemented by the whole Goodman library and the whole ethos is ST run and ST based.

COMPANY BUSINESS

It may not sound the sexiest on-line service, but AST On-Line has been around for a year and represents an unsung corner of on-line services. This totally free service was set up by computer manufacturer AST a year ago and contains information about machine settings, technical bulletins, software and field change data.

Like many BBSs AST On-Line has file areas where updates of software are made freely available to users. The UK AST on-line provided nearly 10,000 software downloads in its first year and in the US where the service has been established for longer a similar period brought nearly 90,000 calls.

AST On-Line can be accessed by any computer user with an a synchronous modem.

MICRONET

Micronet is Telecom's dedicated on-line service for the computer user. It lives in a spacious corner of the Prestel service and works as an interactive magazine with sections for each different computer, a newsdesk and a real time letters page. Any subscriber can send a letter to any of the areas while on line and the letters are answered and updated on a daily basis.

ARM AND A LEG

Comms costs cash. From the second you unwrap the modem onwards, you're going to pay out.

Buy the fastest modem you can afford (A 2400 modem goes eight times as fast as a 300 modem.) Whatever machine you use, find a dedicated comms user for that machine and chat about the best comms software available.

In simple terms, the easiest to use software that does the job you require will be your best bet. The simpler the job is to do, the quicker you will do it

Every second that you're on-line costs the appropriate phone call cost plus any fees levied for on-line time if you're accessing a commercial system. It's easy to stare blankly at the screen wondering what next? It's cheaper to log off and wonder what's next. If you run into difficulty on an on line service and there's no help or documentation available to effect a swift solution, get off-line. This won't solve the problem but you'll have more time to think about it without your bank account dissolving into a dial-tone.

Finally, get an experienced comms user to look over your shoulder for your first few log ins. The expert can help you climb out of any on-line pits that you've dug for yourself and show you efficient ways to work.

News is slotted in as it arrives and editor Paul Needs keeps his finger on the pulse of what's happening in the micro world.

Feature articles complete the magazine format and the viewdata screen of Micronet offers a lively and colourful way to keep up to the minute on what's happening. There is the ability to offer download files but the viewdata format of Micronet doesn't offer itself to file transfer as well as the more familiar scrolling systems.

01 FOR THE AMIGA

Tony Miller's Amiga based BBS has been around as long as the Amiga's been popular and a quick look at the userlog and the message areas found callers of note from the Amiga world.

01 (Shouldn't that be 071) For the Amiga offers its users over 1,000 download files and via echo mail picks up about 200 new Amiga messages every day from around the globe. The software is the ever friendly Dialog and multi-user multi-line modes are supported.

MOUSE2MOUSE

It's difficult to find a Macintosh BBS so Mouse2mouse comes as a pleasant oasis in a desert of comms populated by PC, ST and Amigaphiles. It follows the Apple philosophy of user friendly interfaces and offers a Mac user a pleasant familiar and friendly subject at the other end of the phonelines. We don't have a lot of info on Mouse2Mouse currently because the line is permanently busy, but its reputation as Mac City is growing fast. Give it a try and tell *Express* what you think.

BATTLE OF THE GIANTS

Compuserve and CIX are currently battling to see who can surface as the sexiest and most important of the commercial services on line in the UK. CIX seems to attract more of the journalists and industry figures and the conversations in the conferences on CIX make good reading.

Compuserve seems to have a sterner face with a massive mainframe-based net around the globe crammed with information about everything. A wrong keystroke and the use of your credit card on Compuserve could leave you the proud owner of a Corvette or a Condo. If it's for sale you'll find it on Compuserve along with product specific areas about every computer in the good old US of A.

CIX and Compuserve are both commercial systems, though, and it's a good idea to keep the stopwatch out as you pay for on-line time as well as the phone calls.

THE ELEVENTH NUMBER

OK, so you've counted and we've looked at ten on-line services. There were many more available, but we've decided to leave the rest to you. Write to *Express* at the usual address with your idea of the best BB available. We'll check out the nominations and feature the best one as a BBS of the week. ■

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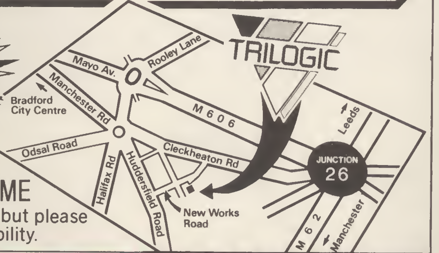

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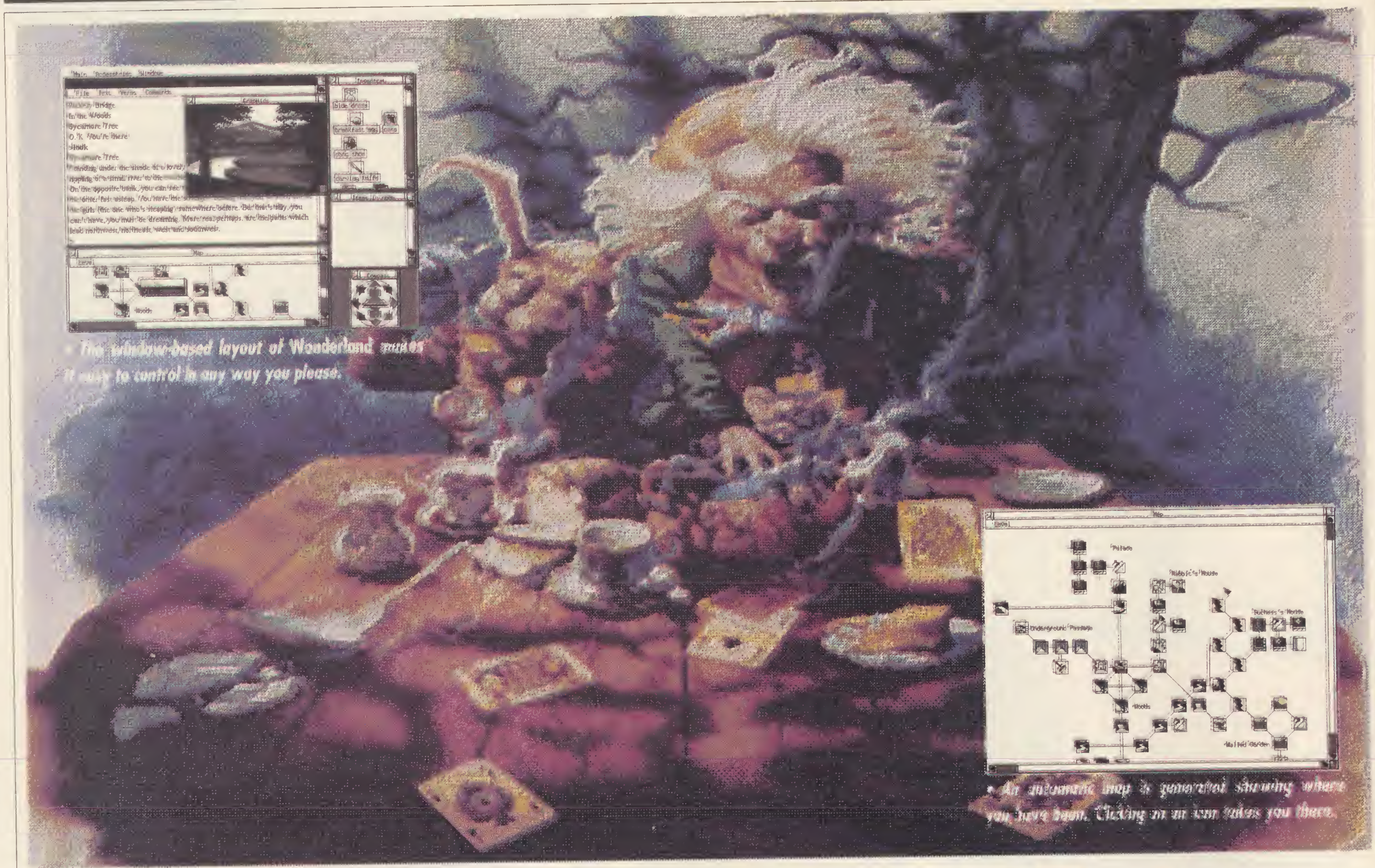

• The window-based layout of Wonderland makes it easy to control in any way you please.

• An automatic map is generated showing where you have been. Clicking on an icon takes you there.

PLAY ME!

Virgin's latest adventure takes you through the looking glass into Wonderland. Stuart Anderton drank the potion and shrank...

I've never been a great fan of adventure games. I cannot relate to being a half-elf with magical powers or a shipwrecked space explorer; far too much suspension of disbelief is required. I therefore approached *Wonderland* with no great enthusiasm, as the idea of pretending to be a Victorian pre-teenage girl did not greatly appeal. How wrong can you be?

Wonderland is an adventure game, but it is not a traditional adventure game. It has the most intuitive and easy to use interface of any role playing game. The screen is based on the trendy display of the moment, Microsoft Windows. *Wonderland* does not actually run under Windows, but it uses a very similar looking environment.

At the top of the screen you have a menu bar containing game commands such as your mouse preferences and the window layout. The rest of the screen contains several windows in which you play the game.

TRADITIONAL

The main window is the most traditional; here you are given a text description of where you are and you can type in commands in the time-honoured manner. Pull-down menus make life easier; one labelled 'Verbs' gives you a list of possible commands – Eat, Take, Drop, Search and so forth. Selecting one then gives you a list of all the object you are carrying and/or are in the room that you can do that particular action to. For instance selecting Eat would give you a list like Cake, Sugar, Sherbet from which you choose with the mouse. Another aid is the ability to copy and paste a command to save retyping.

The other windows are what make the difference. There is a map window which shows you exactly where you have been. You can return to any location by clicking on its icon with the right mouse button – you get the option to go there or to view it (see below).

The inventory window shows what you are carrying in iconised form. Again you can click in an icon and be presented with a list of things you can do with it; another click performs the action. The Items in Room window is similar to the Inventory window. It only displays what you can see; for instance if the room contains a box you will only see the box icon initially. If you click on the icon and choose 'Open' then the contents of the box will appear as icons. You can pick up an object by selecting it and dragging it from the Items in Room window to the Inventory window.

A compass window indicates which directions you can take, and you click on the relevant arrow to move.

INTERESTING

The most interesting of the windows though is the Graphics window. Whenever you enter a room for the first time a colourful picture is displayed showing the room. Often these pictures are accompanied by some animation and music (played through an AdLib or Roland sound card). You can click on anything you see in the graphic to get information on it.

So that's the set up – a uniquely easy game to play for the PC. There are five different ways to give most commands; you simply choose the one you are happiest working with. You can make it a straight text only adventure if you are a purist, or work the game almost entirely with a mouse for laid-back adventuring.

But all I've described so far is the way the game is operated; what about the game itself?

Wonderland is in the best tradition of the Magnetic Scrolls games from which it is descended. There is a sense of humour and lightness of touch to the game that make it fun to play; and that, after all, is the most important thing. For Carrol fans the game is reasonably true to the book; all the main characters are there – the Mad Hatter, the March Hare, the White Rabbit, the Queen of Hearts, the Cheshire Cat – and the text manages to be in keeping with the book (despite several spelling mistakes).

The puzzles are varied; some are obvious, others almost impenetrable and yet others complete red herrings. If a puzzle does get you down, a neat graduated help system gives you ever more specific hints on a puzzle. Some puzzles have a dozen or more levels of help.

Wonderland is a great looking adventure and it plays well too. There will be a series of games in the coming year or two that use the same interface system, and this kind of set up will set the standard for adventure games for the foreseeable future. The only bad point is the extortionate price – how ordinary mortals are supposed to afford £35 is beyond me... ■

Wonderland *is available for the PC at £34.99 and the ST at £29.99. An Amiga version is due out in the new year.*

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SPECIFICATION

- ★ ***Processor:*** Intel 80C88 at 4.9152Mhz.
- ★ ***Operating System:*** Compatible with MS-DOS 2.11.
- ★ ***Internal ROM:*** 256K containing BIOS, operating system and applications suite.
- ★ ***RAM:*** 128K with an internal RAM disk, configurable from 8K. Externally expandable to 640K RAM.
- ★ ***Keyboard:*** 63 keys, QWERTY, IBM PC BIOS compatible. Buried numeric pad and function keys. Optional key click.
- ★ ***Character Set:*** Extended IBM ASCII (255 characters).
- ★ ***Mass storage:*** credit card sized memory cards (32K or 64K or 128K RAM).
- ★ ***Display:*** Graphics LCD, supertwist technology, MDA compatible, 40 columns x 8 lines, 240 x 64 pixels (with the option to window a full 80 x 25 character display). Keyboard controlled contrast.
- ★ ***Peripherals:*** 60 pin expansion BUS to take serial and parallel ports and memory expansion units.
- ★ ***Size:*** 8" x 4" x 1" (200mm x 105mm x 29mm).
- ★ ***Weight:*** 495 grammes (with batteries).
- ★ ***Applications:*** calendar and diary, address and phone book, Lotus 1-2-3 compatible spreadsheet, text processor, communications software.

COMING SOON!

In addition to the excellent software built-in to the Portfolio Free of Charge (see right), other software and peripheral products, such as the sophisticated Pocket Finance package and serial/centronics interfaces are available. And it doesn't stop there. Many manufacturers have recognised the potential of the Portfolio and have already started to design new peripherals and software. Products currently under development include: Serial interface with built in mini modem, Apple Macintosh interface, business, utility and programming software plus a range of adventure and battle strategy games. For further free details on the Portfolio range, fill in the coupon below and return it to Silica Systems now.

5 BUILT-IN APPLICATIONS TO GET YOU ORGANISED!

To get you started, Portfolio comes with a suite of five useful functions built-in, all accessible from a simple menu display.

TIME MANAGER

More than just an electronic diary, the Portfolio Time Manager enables you to plan your appointments via a comprehensive calendar and diary. It can even be programmed to sound an audible alarm at specific times to remind you of important appointments.

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ADDRESS BOOK & DIALLER

Portfolio has a complete address book facility that allows you to store hundreds of addresses and phone numbers. And, at the touch of a button, you can retrieve any one of them, or search for a specific grouping, such as "all Italian restaurants". And, when you are ready to book your table, hold your Portfolio to your telephone mouthpiece and use its special built-in tone dialler to dial the number for you.

TEXT PROCESSOR

The Portfolio's built-in text processor program includes word wrap, line and column count, string search, in fact most of the functions you would find in a word processor. It handles printer and word processor control codes and allows easy transfer of files between Portfolio and your desktop PC.

SPREADSHEET

For real calculating power, Portfolio has a Lotus 1-2-3 compatible spreadsheet built-in. It has 127 columns x 225 rows and reads/writes Lotus V1.0 and V2.01 files, so you can transfer data to and from Lotus 1-2-3 on your desktop PC. The Portfolio's 256K ROM includes MS-DOS and PC BIOS compatible systems software.

MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.

POWER SUPPLY

Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A 'battery-low' warning and memory back-up ensure that information is not lost when the batteries are changed.

INTERFACES & PERIPHERALS

Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

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Before you decide when to buy your new Atari Portfolio, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after buying your Portfolio, when you may require additional peripherals or software, or help and advice with your new purchase. And, will the company you buy from contact you with details of new Portfolio products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is a new division of Silica Shop, the UK's leading Atari specialists. This new division has been established to provide a service to the more serious home user, as well as to business and education purchasers. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now, for our latest Free literature and begin to experience the "Silica Systems Service".

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THE LASER SQUAD

Laser printers offer the best quality of printing you can fit on your desk. EXPRESS explains how they work and the different types you can buy

Laser printers are big, ugly heavy machines which cost a fortune – and everybody wants one. The reason is pretty straightforward; laser printers are the highest quality desktop printers you can buy.

A laser printer is very flexible; unlike other high quality printers like daisywheels which can only print text of a certain size and style, a laser can print any typeface in any size (software permitting) and can mix the text with graphics. Changing typeface is a matter of having the appropriate software on the computer, or in some instances plugging a cartridge into the printer.

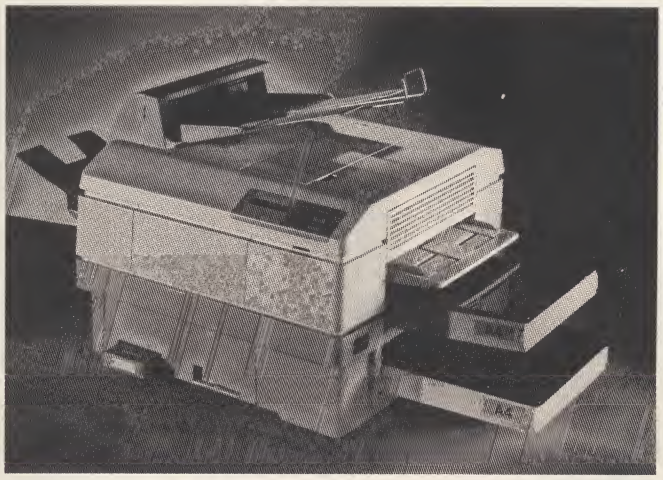
INSIDE A LASER

The internal mechanics of a laser printer are similar to the innards of a photocopier. At the core of the machine is a metal coated drum. The coating has a special property – it picks up static charge very easily and the static can be discharged by shining light on it.

During the printing process the drum is charged with an even coating of static. An extremely thin laser beam is controlled by a set of mirrors and shutters so it can shine on any part of the drum. Where the beam strikes the drum the static is discharged, so the laser beam 'draws' the page on the drum in light, leaving the static charge only on the areas where the ink is to end up. When this is done the drum is rotated and covered with toner; an extremely fine powdered ink. The toner only sticks to the areas with the static charge; it falls off the rest.

Now the drum has the image of the page stuck to it in powdered toner. The paper is then pressed onto the drum and the toner comes off onto the page. It is still a powder, however, so the paper is passed through extremely hot rollers which melt the ink onto the paper, and the finished page rolls out.

All laser printers share this mechanism; indeed there are only two or three manufacturers of the actual printing units. The differences appear in the electronics and software which controls the mirrors and shutters which draw the page. There are three different classes of laser printers, which differ only in this electronics, but it does make a huge difference.



• A typical laser printer: not small, not cheap,, but excellent quality printing.

DEDICATED LASERS

The cheapest kind of laser printer is the dedicated machine. The two computers which have dedicated machines are the Atari ST, with the SL804, and the Archimedes which has a couple of third-party printers. These have the bare minimum of electronics in the printer, the mechanics are controlled directly from the computer. This has its pros and cons.

The main advantage is that it is very cheap because there are no extra electronics. It can also be fast, if you have a powerful computer.

The principal disadvantage of a dedicated machine, besides the fact that each model will only work with one brand of computer, is that it ties up your computer's processing power in a big way. A sheet of ordinary A4 paper measures around eight inches by eleven inches; a laser printer prints 300 dots per inch, so the computer has to calculate whether to print 7,920,000 dots – that's a fraction under a megabyte of data. As well as the sheer storage space required, the computer will have to do calculations to draw the letters of the fonts and resize any graphics. The Archimedes holds up well to these demands and dedicated printers work well with the machine. Atari's dedicated machine on the other hand struggles a bit with anything less than a Mega 4.

GENERAL PURPOSE

There are two standards for non-dedicated printers, both of which are widely supported by software and differ in the features they offer and the prices you pay. The two standards are PCL (commonly referred to as LaserJet) and PostScript

Both operate on a similar principle. Rather than sending page to the printer as a series of dots, they use languages rather like computer languages such as BASIC. Called page description languages, they use commands to tell the printer what letters to print where. For example this is the set of commands which produces the word *'EXPRESS'* on our cover:

```
%%IncludeFont: Helvetica-Black
/f1 /|______Helvetica-Black dup RF findfont
def
{
f1 [92 0 44 109 0 0] makesetfont
217 3193 moveto
0 0 32 3 0 (EXPRESS) ts
}
```

It's not exactly plain English, but the printer understands it perfectly. Page description languages make it less important for your computer to know exactly what hardware is at the other end; the above listing will print the logo the same on an Apple LaserWriter and a Linotronic 300 typesetter, because both use the same PostScript language.

The problem with laser printers using a page description language is that they have to have a computer built into them to interpret the commands. Indeed, as we have already seen, you need a powerful computer to run the insides of a laser printer, so frequently the most powerful chips and biggest memory are inside the printer rather than the computer! Obviously this ups the price a bit.

LANGUAGES

The choice between the two page description languages is usually guided by price and power.

The PCL language used by the LaserJet and its compatibles is the cheaper option. Unfortunately it has a major disadvantage – the way it handles type. With a LaserJet you have to send the printer a dot-by-dot bitmap of every letter of text you are going to use. You only have to download each alphabet once, but even so it takes time and you have to store all the typefaces in every size you might ever want to use on a disk – which takes up no small amount of space. You can plug fonts in as cartridges, but this is expensive and inflexible.

PostScript on the hand is a much more flexible and powerful system – and, you guessed it, it's much more expensive too. PostScript uses outlines of typefaces which it can scale to any size you like without having to download a fresh set of data every time. Its graphics commands are also much more sophisticated.

The combination of these factors makes PostScript ideal for professional DTP applications. Because the PostScript printer does the work based on your commands, the commands remain the same no matter what actual printer you are using. This means you can use a relatively cheap printer for proofing your designs then use an expensive one for the final output, and be confident that the results will be the same (except for the higher print quality of the expensive one of course). ■

TYPES OF LASER PRINTERS

TYPE	ADVANTAGES	DISADVANTAGES	PRICE RANGE
Dedicated	Extremely cheap	Depends on computer	£600-£900
LaserJet-compatible	Relatively cheap	Inflexible	£900-£1,500
PostScript	Can do anything!	Expensive	£2,000 upwards

THE ATARI ABC

Now, there's a PC-AT compatible that not only solves problems like other AT compatibles, it also solves the one problem that its predecessors have created … affordability.

Silica Systems are pleased to present the new Atari ABC. The ABC is a 286 AT compatible that runs at over 5 times the performance of the IBM XT. This is achieved by combining the power and speed of a 16-bit 286 processor, with Atari Corp's development experience and engineering capabilities, which use the very latest in design technology. However, the Atari ABC's are available at 'XT prices' and many XT owners will wonder why they paid more, but got less!

The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

At its remarkably low price point, the ABC is ideally suited for home, office and educational use and will take full advantage of the vast range of PC compatible software. And, with 12 months FREE on-site maintenance (8 hour response), you can rest assured that your ABC will be fully supported.

The ABC is the latest addition to a comprehensive range of both 286 (8Mhz or 12Mhz) and 386 (16Mhz and 20Mhz) PC's, from the Business Systems Division of Atari Corp. Atari's PC range offers an unsurpassed combination of reliability, compatibility and expandability, with unique features like Atari's 44Mb removable hard disk on their PC4. Return the coupon NOW for further details of the complete range of PC products from Atari's Business Systems Division.

ABC TURBO
AVAILABLE: JUNE 90

To put the ABC even further ahead of the competition, we have introduced a special 'Turbo' version, which includes a super fast RLL hard disk controller to increase the data transfer rate from 150KBytes/s to 800KBytes/s, with a performance index of 4.801. Plus! to provide exceptional graphics with an outstanding colour resolution of up to 1024×768, we have included a Super VGA graphics adaptor and a 14″ VGA colour monitor (which also supports 1024×768 resolution), all for an additional price of only £300. Check the ABC Turbo against the competition, at only £1299 (+VAT) with 30Mb hard disk, Super VGA colour graphics capabilities, plus 12 months on-site maintenance, it offers unbeatable value.

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Sounds simple? Don't you believe it. Narco-police is hot! Filled with 3D graphics coded to a tee by programmers actually living on the borders of Peru and Columbia! Honest! What more credibility could you ask for? These guys actually live through this scenario on a day-to-day basis just to get to work godammit! And here comes *Express* and just gives away all their hard work for nothing.

But we're not the only ones to blame for this vicious exploitation of Third World resources. A certain wonderful company going by the name of Active Sales and Marketing is actually supplying the stuff. At £24.99 a shot on the 16-bits and £9.99/£14.99 on every 8-bit other than the Oric, *Narco-Police* only hit the shops yesterday! So now's your chance to blaze into '91 with a steaming Ouzi at your hip by answering seven simple questions.

But before you start cranking the old brain into action just remember all entries should be at this office no later than Monday 7th January 1991. Okay Maaaaan! – so here we go

1) What was the drug featured in *The French Connection*?

A) LSD
B) Cocaine
C) Heroin
D) Crack
E) Amphetamine
F) Opium

2) Which Columbian city is the centre of the world's cocaine market?

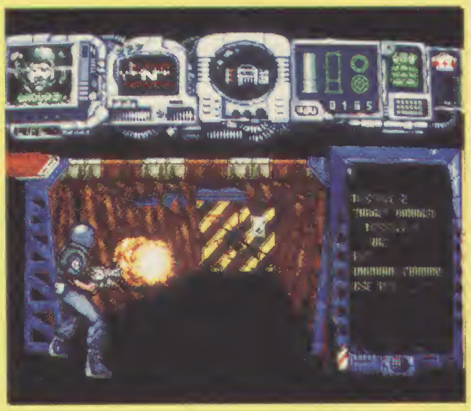
A) Bogota
B) Santiago
C) Medellin
D) Lima

3) Why is cocaine only for suckers? Is it because?

A) It's a waste of time
B) It's a waste of money
C) It's a waste of nose
D) It's hopelessly unhip and you'd do yourself less damage snorting Vim
E) All of the above

4) Which of the following famous people never touched cocaine in their lives, honest guv?

A) John DeLorean
B) Marion Barry
C) Keith Richards
D) Sherlock Holmes
E) Al Capone
F) John Belushi
G) Sigmund Freud
H) Jimi Hendrix
I) General Noriega
J) Stacey Keech
K) Aleister Crowley
L) William Burroughs
M) Carrie Fisher
N) Mickey Mouse



5) In *Miami Vice*, why were the only people who hadn't been in Vietnam with Don Johnson his girlfriends, why did he never get his Armani suits dirty, how if he didn't take bribes could he pay his hairdresser, did he really believe it was OK for men to cry *every* week, was it really his clean-living lifestyle that helped his scars heal up in less than 30 seconds, just where was the carpentry element in the title and why did no one in Miami bleed even when they were torn in half by nearly two minutes of relentless gunfire from an Ouzi 49mm sub-machine gun?

A) Because it was ludicrously fictional
B) Because the scriptwriters probably ate cold turkey for Thanksgiving
C) Because no one cared either way as long as there was plenty of stylish violence
D) All of the above

6) Which famous soft drink used to include cocaine as an ingredient?

A) Lucozade
B) Pepsi-Cola
C) Coca-Cola
D) Seven-Up
E) Milk

7) From the leaves of which plant is cocaine synthesised ?

A) Cannabis
B) Marijuana
C) Coca
D) Opium poppy
E) Lettuce

So there you have it. You're just seven answers, a tie breaker and a smidgen of luck away from winning the goods. All you have to do now is photocopy this page so as not to destroy SDL's wonderful advert on page 81, cut out the form, fill it in and send it off to us here at: "Why did Don have so many ex-girlfriends?", *New Computer Express*, 30 Monmouth Street, Bath, Avon, BA1 2BW.

Name..

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The answers are: 1) 2) 3) 4) 5) 6) 7)

Supplementary question in the event of a tie breaker:

Someone you left off the list of famous abusers is...

.... **(no more than one potential libel action please)**

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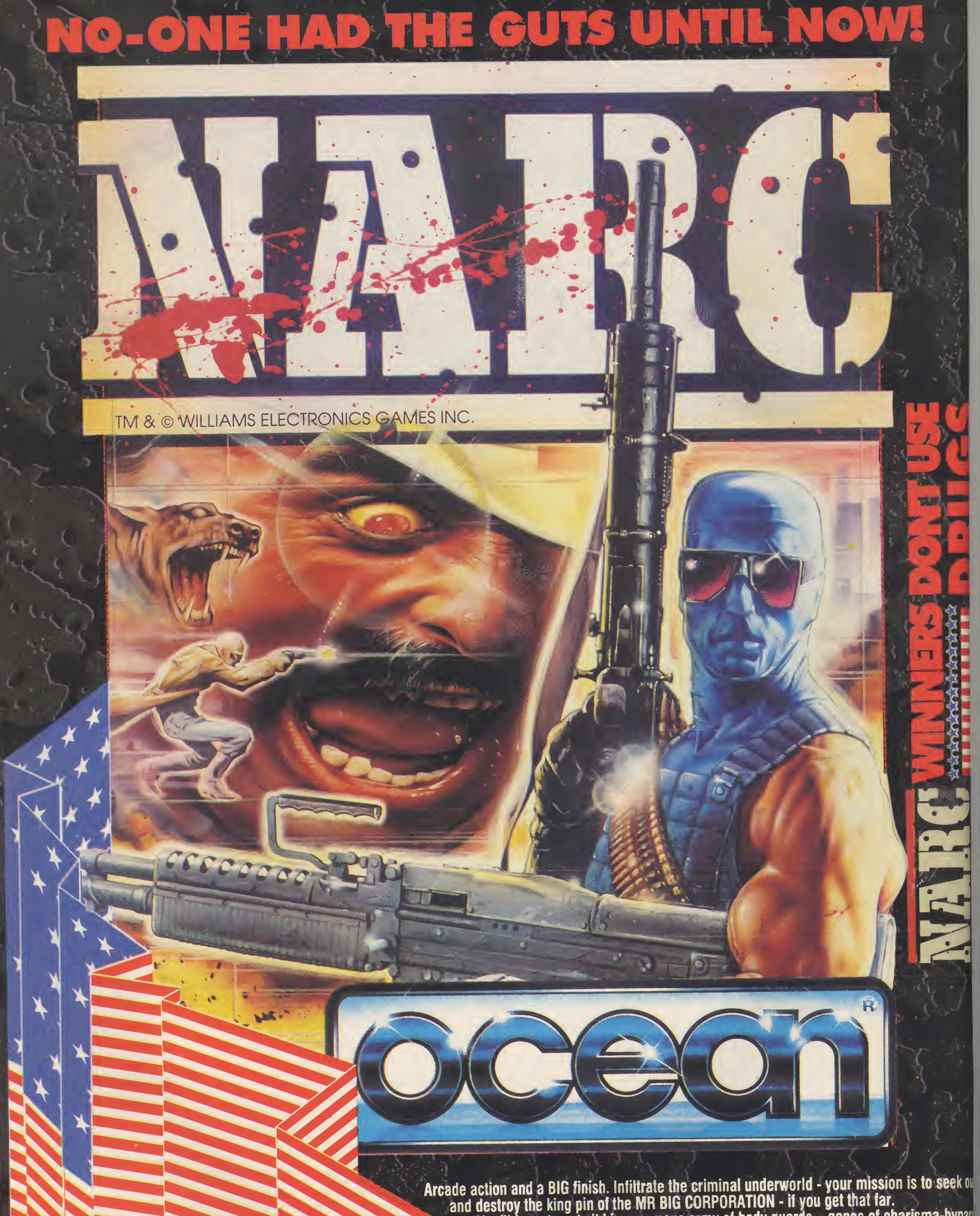
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